

WIN
COMPUSEVE
SUBS
WORTH
OVER
£650

COMPUTER EXPRESS

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

THIS WEEK

AMIGA

A1500 price cut imminent

PLUS: The amazing A500 trade-in deal

ATARI

An ST compatible Unix workstation is announced

PLUS: A stereo ST for only £30 extra?

PC

WordStar for Windows 3!

PLUS: Where can you buy a 486 for less than £2,000?

CONSOLES

The joystick you can sit in!

GAMERS

REGULAR TIPS
& TRICKS FOR
MEGADRIE
NINTENDO
ATARI LYNX
GX-4000
& 44 PAGES OF

**SHOPPING
EXPRESS**

BARGAINS !!!

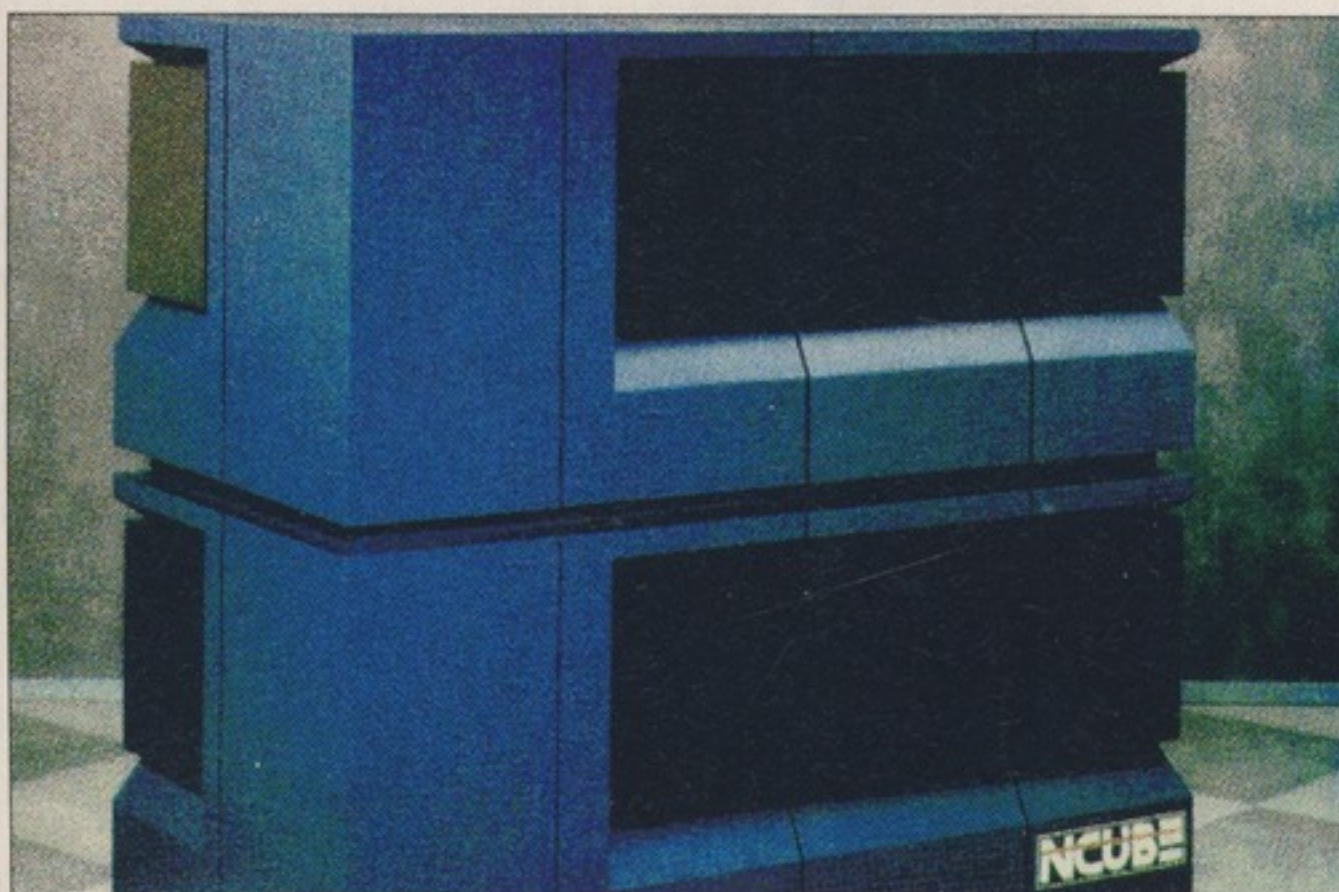


FAXES:

Why buy a machine when you can just slot in a card?

BUDGET IBM 386 LOOMS

Big Blue's business solution is all set to take on the low-cost Macs – full details on page 7



SUPERCOMPUTERS

How you could soon have mainframe power at home

SPEEDBALL 2



Stylishly violent

"WE MUST STOP THE SWEATSHOPS"

BRITAIN'S GAMES AUTHORS SPEAK OUT – SEE PAGE 8



frontend

edited by Colin Campbell

THE WAY OF THE DRAGON



Classic computer game *Double Dragon* is to be made into a movie. The world's favourite beat-'em-up should hit the big screen in the spring of 1992.

A script is being written and publisher Tradewest says it will follow the basic pattern of the game. Arcade fans and computer gamers will remember that *Double Dragon* involves twins Billy and Lee who beat the hell out of hundreds of bad sorts using all manner of martial arts tricks. The point is to indulge in some delicious scumbag wasting while saving a pretty girl.

Tradewest's boss Byron Cook enthused: "*Double Dragon* has all the aspects of a great movie – good guys, bad guys, a rescue, everything. Plus, there are very few people between the ages of 10 and 25 who aren't aware of *Double Dragon*."



Lotus cancels CD launch

Lotus has been forced to cancel a planned launch of a CD-ROM database containing information on millions of American consumers.

Lotus had hoped the CD would catch on with marketing companies, who could use the information to target consumers effectively. But the company had bowed to public pressure and canned the project. The CD was to be launched next month.

Lotus president Jim Manzi said: "Unfortunately we feel that there have been many wrong perceptions about the product. It didn't contain any information not already available through a variety of publicly accessible databases. It was developed in response to a real business need, particularly among smaller businesses."

He stressed that the CD did not include sensitive information such as credit history, or actual income.

BACK TO BASIC

A user group has been set up for fans of that most popular programming language – BASIC.

The BASIC Programmers' Group hopes to build up a library of programs written by users while encouraging further use of BASIC. Founder Mark Blackall commented: "We'd like to encourage use of the program on all machines, allow the exchange of ideas and generally help the BASIC programmer."

He added: "Beginners are especially welcome." BASIC is so popular because it is based on real language, and is therefore simple to use. Call 0924 892106.

Computers in the jungle

Computers have reached the office, the home, the school, and now the jungle...

Missionaries in Papua New Guinea's most isolated villages are using Toshiba laptops to translate the Bible into the 700 or so local languages. Since the natives have no electricity, the missionaries have to rely on

battery powered machines.

Most have turned to 12 volt car batteries, but a few are using solar panels. Some have invested in desktop machines such as the Macintosh, which they operate using gas powered generators.

The missionaries are from the Summer Institute of Linguistics, and they've written their own

software which aids grammatical analysis by presenting on screen the source text adjacent to a translated version.

There's also a word processor which can handle languages which, unlike English, aren't read from left to right and which can deal with unfamiliar characters and grammatical rules.

Slope off on-screen

It's that time of the year when all the jolly, fun loving sporty types slope off for a spot of skiing. But if you don't fancy the Alpine life there's always the safety of your computer.

Microvalue has relaunched old favourite *Winter Olympiad*, which features five different events, at a budget price.

You can indulge in some downhill racing in full 3D perspective, or there's the ubiquitous ski jump, try that most demanding event the biathlon, or slither down the slalom.

Braver people can have a go on the dangerous bobsled. 8-bit prices start at £2.99 while ST and Amiga owners will have to dig out £6.99.



Take a Tally



A new 24-pin dot-matrix printer, featuring a built-in automatic sheet-feeder, has been launched by Mannesman Tally.

Priced at a reasonable £359, the MT82 is, according to the company, targeted at computer users who need a low-cost printer which can make documents look a lot better than your average dot-matrix. "It reflects the growing demand among dot-matrix users for laser printer type features," said the firm's Rob Lyszyk.

In draft mode the MT82 prints at 192 characters per second (cps) and in letter quality at 64 cps. It offers an 80 column width and a selection of resident fonts including LQ Sans Serif and Roman.

For more information call 0734 788711.

'MAD HACKER' DODGES JAIL

Appeal court judges have failed to decide if Nicholas Whiteley – dubbed the 'Mad Hacker' – should be sent back to jail for breaking into university computer systems, and allegedly causing thousands of pounds worth of damage.

Last year Whiteley, aged 21, was convicted of destroying hundreds of disks after hacking into university computer networks. He was sentenced to one year's imprisonment. However, Whiteley appealed and after one month in Brixton prison he was released pending the hearing.

At the hearing on January 22nd Chief Justice Lord Lane said the case would have to be studied carefully before any decision could be made. Whiteley claims that he only damaged information held on disks, rather

than the disks themselves. He argues that information is "intangible" and therefore impossible to destroy. Lord Lane warned: "He should understand quite clearly that if the Court makes up its mind adversely to him, the chances are he will have to go back to prison. He must prepare himself for that."

Whiteley, a former computer operator, says he is desperate to clear his name in order to pursue his career. But he isn't optimistic: "I wouldn't bet a million pounds on it going my way. It's an uphill struggle to get our case across. Now it's up to the judges," he said.



PIC: COMPUTER TALK

Whiteley is banned from using computers and is currently living at home and unemployed. ■

What's the Difference?

The man in the suit is Mr Tim Renton, Minister for the Arts. He's lucky enough to be allowed a fondle with the Science Museum's famous reconstruction of Charles Babbage's Difference Engine.

The Science Museum has confirmed that the Engine will be ready by July when it will take centre stage in a special exhibition celebrating Babbage's 200th birthday.

Babbage designed the computer in 1830 but, due to a lack of funds, could not complete the construction. The Science Museum is spending thousands of pounds on the computer to see if it would have worked. The exhibition will run from July 1st until January 1992. ■



It's the ultimate computer program

This piece of kit (below) would set you back £20 million and is capable of wreaking unspeakable chaos. Highly trained Tornado pilots rely on highly trained computer programmers to get the

most out of the machine.

Tornadoes have been involved in hundreds of sorties in the Gulf over the past few weeks, and every one is the result of hours of computer programming.

Before each mission programmers key relevant information, such as flight plan and position of enemy defences, into their computers. A disk is then transferred into the Tornado. The computer actually flies the plane, and it's the pilot's job to make sure the aircraft is following the computer's instructions. The only time he takes over is when he's attacked by the enemy.

Group Captain Bill Hedges, who commands a detachment of Tornados said: "The computer is central to the Tornado's flying capabilities, and is the main reason our low-level bombing missions have been so successful." ■



CONTENTS

FEATURES

Files on fax

What used to be huge and expensive pieces of office equipment are now cheap and small enough to fit inside your computer – page 62

Super duper computers

The technology in today's supercomputers could be inside tomorrow's home machines – page 10

ST Series

The best sound programs available to make unbeatable music on your ST – page 61

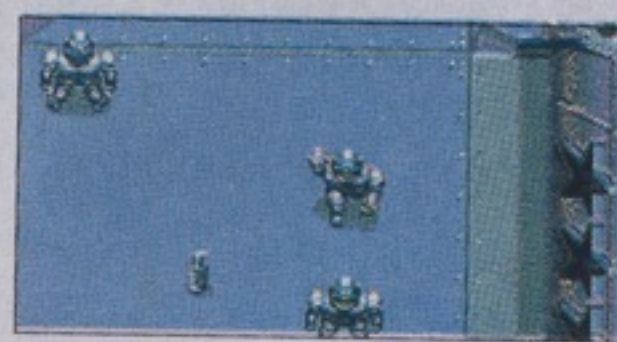
Amiga Series

Some serious databases for getting your word processing into order – page 64

EVERY WEEK

Games Week

Hot tips and news, plus Speedball 2 review – page 58



News – pages 4-8

SHOPPING EXPRESS

Letters	13	On-line	35
Mac	16	Centrefold	35
CPC	17	Circuit City	44
Amiga	18	Whole Wired	
Archimedes	20	World	46
PC	21	Tech Tips	48
C64	22	Programming	51
Spectrum	23	PD Column	54
ST	26		

Trap for BASIC errors

A new utility will make it easier for BASIC programmers on the Amstrad CPC to trap errors. It will also be useful for spotting the invariable mistakes that slip through when typing in magazine listings too.

KWIKREF/X from Parmigold looks at a program and writes a report to the screen containing a sequenced list of variables and their locations. Lines with changed values are marked for attention.

A further table gives a list of lines referring to other lines which provides a cross referencing grid. KWIKREF/X costs £12.95 on three-inch disk and is available from Parmigold on 0666 837215. ■

Scots show

The Scottish Computer Show will be welcome to those people north of the border fed up with having to travel south to London or Birmingham to see the latest in technology.

The show is at the Scottish Exhibition and Conference Centre in Glasgow on February 26-28. There are hundreds of stands booked with exhibitors as diverse as computer companies, publishers, and service organisations.

The Data Protection Registrar's office will be represented offering advice to individuals and businesses. And there should be a few bargains for the computer shopper. ■

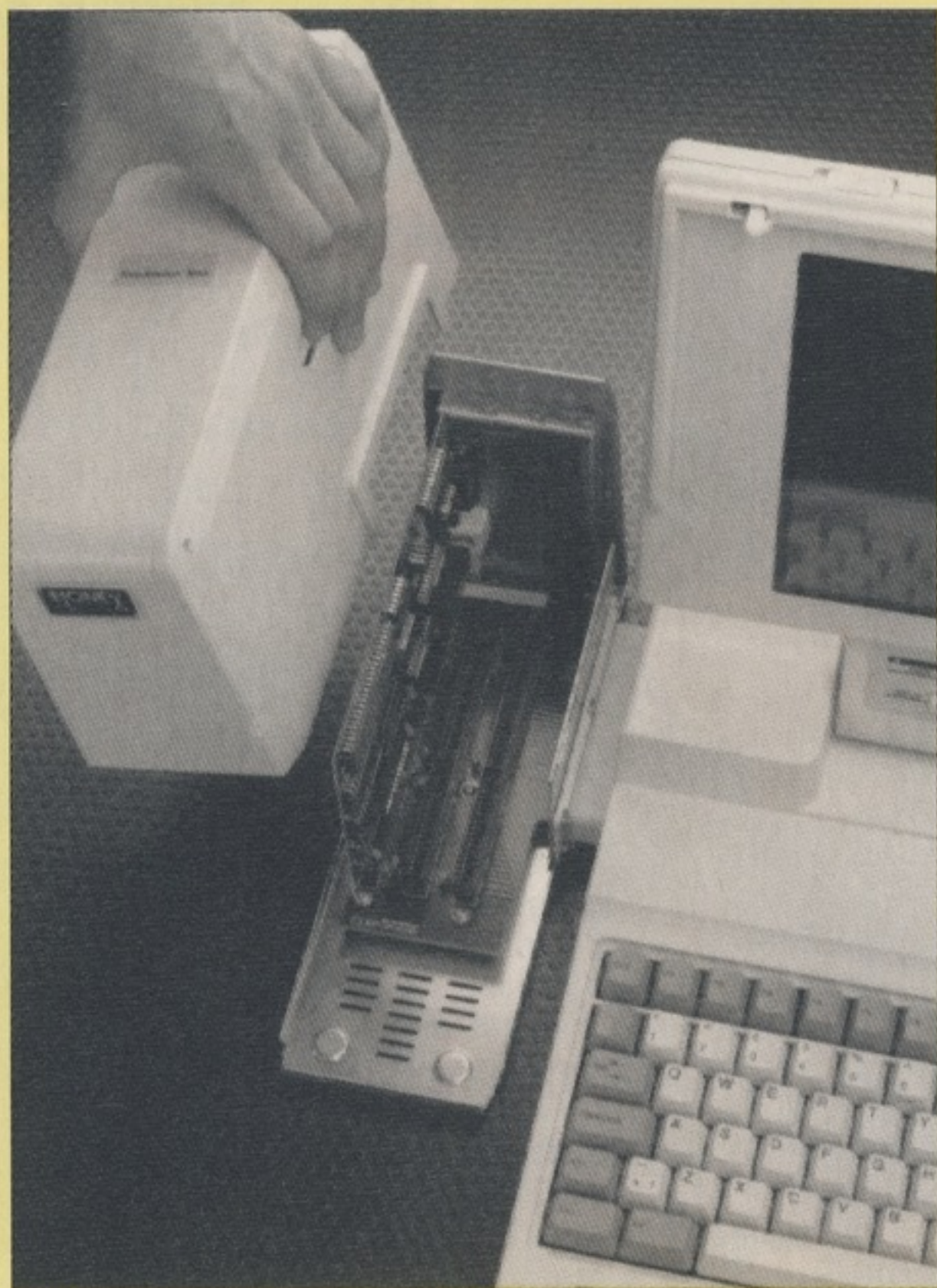
Design on special disks

A range of removable hard disks for Atari PCs and a large scale monitor for the Atari TT is available in the UK from German Atari specialist Elektronik GMBH.

The ProGate external hard disks are available in capacities from 20-440Mb and are all designed in house at Elektronik's Berlin research laboratory.

Software provided with the drives allows 12 partitions per disk, selectable boot partition, write protection and password. There are also compatible tape streamers available for the disks and similar models available for the ST.

Elektronik is on 010-49-30 391 20-02. ■



• Elonex: storage.

Data hungry laptop

An enhanced 386sx based laptop with 100Mb of storage has been launched by Elonex.

The £1,695 LT386SX/P weighs in at 6.5kg and has a 16MHz 386sx, VGA mono display, 1.44Mb floppy, a mouse and supplied with a carry-case, MS DOS 4.01 and Windows 3. More details from Elonex: 081-452 4444. ■

Take control

Amiga owners will soon be able to invest in a useful hand-held mouse device, currently only available for PC users.

The Icontroller fits in the hand, allowing you to control your cursor without taking up valuable desk space. You can move the cursor with a press of the thumb, and it's easy to get at the mouse buttons.

The Amiga version should be out within a few weeks, retailing around the £60 mark. Call manufacturer SunCom on 0453 753565. ■



Name that voice

A voice recognition system which will be used for identification purposes has been launched.

Users must speak into the device, which will take about 10 seconds for the computer to recognise the speaker. Manufacturer British Technology claims the rate of false rejections is as low as one per cent. ■

Under £1,000 and in the High Street

IBM SET TO LOW COST

IBM is set to launch a 386sx version of its low cost PS/1. The firm is understood to be aiming at a sub £1,000 price point with the existing 286 based PS/1 dropping in price.

PS/1, which was launched six months ago, has achieved some success among home and small business buyers. It currently costs £999 and is available through High Street stores such as Dixons.

The move is being seen as a direct response to Apple's success with its low cost Classic which, in its popular hard disk configuration, costs just under £1,000.

The PS/1 386sx is likely to come with a free copy of Microsoft's 'Mac like' operating environment Windows 3. This would make the machine a low

cost Windows workstation and an attractive option for computer buyers looking for power without an outrageous price penalty.

Dealers are predicting that the machine will be launched within the next two months with stocks available almost immediately. To run Windows the PS/1 386sx must come with 2Mb of RAM on board, and a 40Mb hard disk is almost certain to be included. The 386 chip will allow to machine to run at a nippy 16MHz.

Both IBM and Apple are keen to win a large share of the home and small business computer owner in Europe and the US. Sales of the PS/1 have been satisfactory since launch, although it is Apple's Classic which is attracting the most buyers.

IBM is hoping that keen pricing, with the advantages of

Computer system to stamp out fraud

A software company believes its new computer system will help stamp out credit card fraud by analysing people's buying habits.

Xpertscore from Leigh-based Attar Software deals with patterns of fraud both in applications for credit cards and the use of cards by a person other than the account holder.

Managing director Akeel Attar says fraudulent credit card applications are a major problem for stores which issue their own credit cards: "The problem is people apply for credit when they can't afford it. They use the card extensively over a period of a few days and are then untraceable because the

address given is false. The program analyses data patterns from a series of examples of credit card fraud. It then identifies patterns showing the policies and techniques used by fraudsters."

Transaction fraud as a result of loss or theft can also be tackled by the system. "Patterns of card use can be analysed for each customer," says Attar. "A card that's normally used for petrol or restaurants and is suddenly used for a trip to Harrods will spark an alert as it doesn't fit with its normal pattern of use. In these cases the account holder can be notified and the item checked to ensure it's a genuine purchase."

A BarclayCard spokesman confirms the

need for controls on credit card fraud: "Fraud is a significant problem. The figures for 1989 showed a loss of £15 million on credit card fraud with Barclays."

He agreed a system to analyse patterns in data would be an effective way of dealing with the problem. "People tend to fall into a more set pattern than they realise in credit card use. You must ensure you have a genuine case as a spending blitz for holidays or birthdays is not uncommon."

"There are, however, certain patterns of spending and certain patterns of fraud. A data analysis system could well prove cost effective in detecting when a credit card has been stolen." ■

gh Street in bid to bring buyers back

TO LAUNCH ST 386 PC

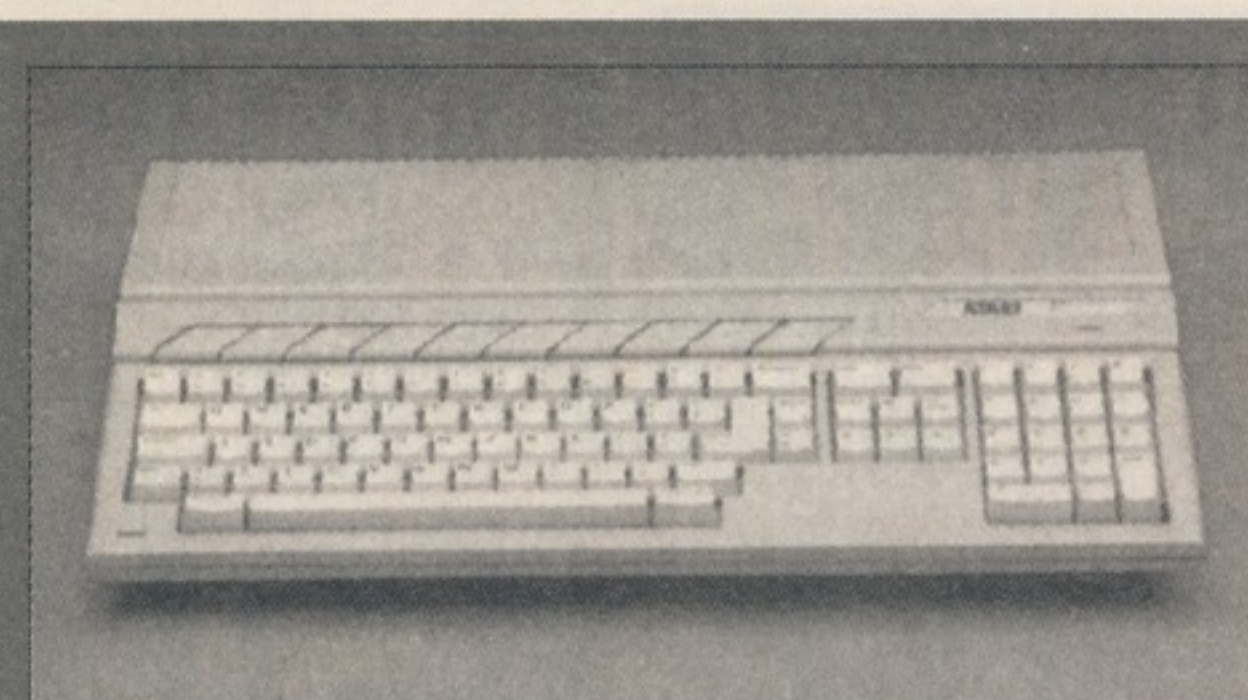
standard compatibility, a fast processor and the easy to use Windows environment will bring buyers back.

Some have criticised the PS/1 for being too little too late. But a more powerful model and a downward adjustment in the pricing of the original will strengthen IBM's position. David Smith of official IBM dealer Worldwide Computers commented: "People say the PS/1 is expensive, and can't be expanded. But if you include the extras that come with it as standard, it's actually very competitive with many low cost 286 machines."

A spokesman for IBM refused to comment on the situation. "We haven't announced anything, and we don't speculate on forthcoming product," he said. ■



• PS/1: faster model coming soon.



• STFM: now in stereo

Sound out ST in stereo

A new £29.95 cartridge allows the ST to play back in glorious stereo and takes advantage of new software written with stereo capability.

Stereo Playback from Microdeal contains a 2 channel drum sequencer which lets you have up to 15 sampled drums and up to 50 drumbeat patterns in memory at one time. This allows you to assemble the patterns into songs of up to 99 patterns. 10 songs can be held in memory at once.

There's also a Stereo demo driver for the Quartet sequencer, and routines to assist you in writing stereo sound into your own games. More information from Microdeal on 0726 68020. ■

Professional PC package

The **Top Copy Plus** word processing package for the PC has been upgraded to **Top Copy Professional for 1991**. The new version offers page preview, on-line thesaurus, and newspaper column type display as well as HP soft font capability.

A further feature is a spooling

save as you type option that avoids accidental loss of documents in the event of pilot error or power failure.

Top Copy Professional costs £228.85 and there are upgrade prices available to users of **Top Copy Plus** and **Top Copy Professional**. Call Top Level Computing on 0453-753955. ■

From the makers of Amiga Format

In the wake of **Amiga Format's** extraordinary success, two more Amiga magazines are to be launched by Future Publishing.

Future, also responsible for NCE, says **Amiga Format's** 80,000 plus readers are demanding magazines with specific themes. The first will be a "total games exclusion zone" called **Amiga Shopper** which will be aimed at the serious Amiga user who is interested in programming, public domain, productivity, buyers guides and, most importantly, bargains.

Amiga Shopper will be edited by former **Amiga Format** editor Bob Wade and will cost only 99 pence. A sneak preview sample will be distributed free with the April issue of **Amiga Format**, with the launch proper in May.

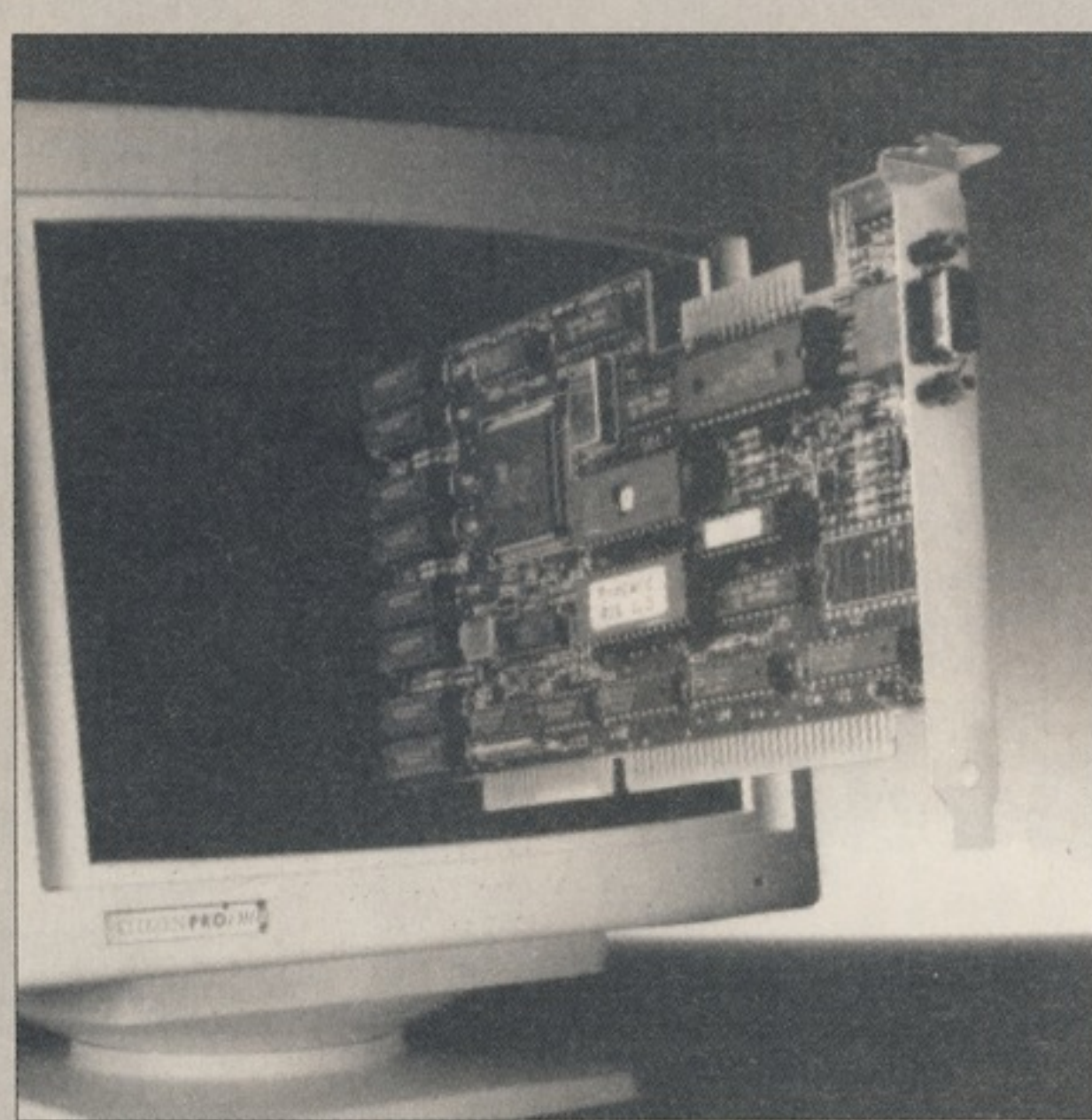
The second mag, **Amiga Power** will be 100 per cent games based, with colour throughout. It will cost £2.95 and will come with a complete and "very high quality game" free on the cover every month. Two editors with many years experience

• **Amiga Format:**
Now there are three



in the games market will be combining forces to bring **Power** into being. Matt Bielby transfers onto the title, vacating the editor's chair on **Your Sinclair**, and Gary Penn, until recently editor of **The One**, will be a consultant.

Publisher Greg Ingham fended off fears that **Amiga Format** would be harmed by its two offspring: "You'd have to be a madman to do anything which might harm **Format**. It is the fastest growing computer magazine of all time on sales, and it's still growing. As in the past **Format** will continue to cover all aspects of the Amiga, but readers have said they want specific magazines too, and we agree." ■



• Big deal: monitor and graphics card together.

Citizen offers an easy life

Monitor buyers might do well to check out a nifty little concoction offered by peripherals manufacturer Citizen.

Bargain hunters will be offered the Procard 816 graphics accelerator when they buy the ProCM14i 14-inch colour monitor. The price for this twosome is £899 representing a saving of 12 per cent.

"The combination will offer buyers a total display solution," said Citizen's Simon Cooper. "It makes life easier because the buyer is assured of operational compatibility." ■

Cheap and simple offer going Loco

A new version of Locomotive's PC wordprocessor **LocoScript** was launched last week.

Version 1.5 now includes split screen editing, pop-up keyboard diagrams, phonetic spelling correction, selective spelling checker, ability to search for a file or directory from the disk manager and the facility to control whole directory trees.

LocoScript was originally launched for the PCW and is used by millions. The PC version was released last May to general satisfaction.

Locomotive's Chris Hall said: "For just £125 it delivers a powerful range of word processing features, and an impressive integrated database and mail merge facilities."

Upgraders are being offered cheap and simple options for getting their hands on the program.

Call Locomotive on 0306 740606. ■

THE WEEK
IN VIEW

Renegade publisher Tom Watson argues for quality, before big name licenses...

Software publishing has come a long way in its short life. Seven years ago, companies (or more frequently individual programmers) exhibited their wares on trestle tables at informal shows and sold their games in unsophisticated packaging. Nowadays, their operations are substantially more sophisticated with multi-million pound marketing spend, international conferences, high-profile brands, one or two of them even own a fast car. Software programmers are nowhere to be seen.

So, as the industry developed its commercial skills, something was forgotten along the way: the games themselves. Original products started to take second place to licences. Slowly but surely, marketing muscle began to tell and companies engaged in buying wars to see who could gain the supposed top licence.

To many publishers, original products became less important. Some publishers will even admit privately to the 'empty box' scenario - when the licence is felt to be so strong that they don't feel that it matters what is in the box. The industry has started to take too many lowest common denominator decisions.

This carries many dangers:

- If publishers don't push themselves to produce the best games, consumers will all too soon weary of a stream of repetitive products, and buy less.
- Developers become starved of investment for the creation of new work, being strongly 'encouraged' instead to work on licensed material.
- As the future of optical/console systems beckons, a reliance on the intellectual property rights of others will leave our industry starved of creative ambition.

We must be prepared to recognise that we contribute to an industry which is seen throughout the world as having the finest 16-bit development talent. That talent needs stronger and more positive creative direction from its publishers. It needs to be encouraged to work, on a creative basis, with other entertainment industries. To deny or hamper that creativity will ultimately lead to a dependence on the creativity of others, exploiting their work, rather than creating our own.

The status of the developer must be enhanced, the relationships between developer and publisher must improve (another subject) and we must all start to recognise what is really valuable to us - the consumer. ■

Radio bits

Apple is developing a radio-based network to transmit Appletalk-compatible data in the US.

It has already requested permission to use bandwidths from 1850MHz to 1990MHz of the radio spectrum for Data PCS (Personal Communication System). It will transmit data at up to 10 Megabits per second at distances of up to 150 feet.

NCR, which has a comparable system, called Wavelan, running in the states has been refused a licence to set it up in the UK. ■

Gulf War threat to 386 chips

The Gulf War could result in a severe world wide shortage of silicon chips.

Intel, one of the world's leading chip suppliers, has its sole source of 486, 386DX and 386SX chips in Tel Aviv. Further missile attacks from the Iraqis on the Israeli capital would almost certainly halt all production.

The company has begun taking precautions by moving 486 production to the US, but there are no firm plans for alternative manufacturing sites for 386 yet. ■



• Tel Aviv after an early Scud attack.

Amstrad's popular computer deal

PCW PRICE
SLASH

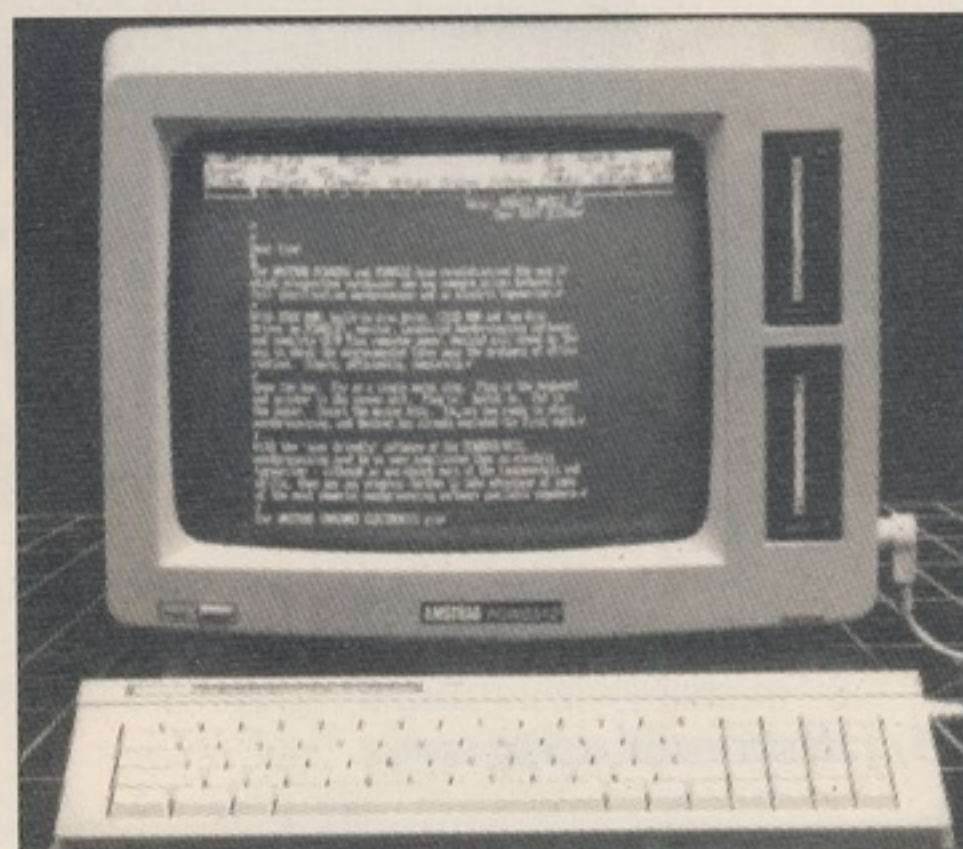
Amstrad has slashed £80 off the price of its entry level business computer the PCW 8256.

The machine, which many say brought serious computing into the home for the first time, is one of the best selling computers of the past five years. A £1 million national press advertising campaign has been promised, confirming Amstrad's continuing belief in the PCW.

The £299 price point includes keyboard/monitor unit and a printer, and, as always, the PCW comes with word processing package *LocoScript*.

Amstrad's latest price cut has fuelled speculation that the company is making room for a complete re-launch of the PCW range. A 1990's version would probably feature 3.5-inch drive instead of the traditional (and outdated) 3-inch drive. However, spokesman Nick Hower said he knew nothing of any such launch, adding that it would definitely not happen before the autumn.

He added: "The 8256 has always been a big seller. The price cut and ad campaign will act as a



• PCW: new lease of life.

stimulant." The PCW range is thought to have sold a good deal more than one million since its launch five and a half years ago.

No promotional plans have been announced for the high end PCW machines.

Meanwhile, Amstrad is preparing for a triple launch at the Hanover Messe in a few weeks time. Smart money is being put on a 486 (probably called the PC5000) and a couple of high-end portables. The PC4000 low end IBM compatible may be launched, although that could be held back until the autumn. ■

Bringing
Hubble
into focus

Computers have been brought in to rescue the reputation of the Hubble space mission.

Specially-developed computer techniques are now digitally focussing the blurred images which the \$1.5 billion telescope has been sending back for the past few months. Instead of helping scientists discover new astronomical phenomena much of the information from Hubble had been virtually useless, because of a basic design flaw in the telescope's mirror.

Now the telescope is sending back the crystal clear images of planets in our solar system as well as new information on stars almost 170,000 light years away. ■

Move up with
a cheap 486

If you're looking to move up into the world of 486 PCs you can normally expect to pay a lot of money. However, Berkshire based Factotum reckons it has the best deal with a sub £2,000 machine launched this week.

The firm says its 486/25 costs less than half the price of IBM's own machine, and is "hundreds of pounds" cheaper than any of its competitors.

The basic Factotum 486 comes with a mono monitor, 4Mb of RAM (expandable to 16Mb), a 32-bit memory slot with a hard disk boasting 80Mb capacity. Digital Research's DR DOS is supplied together with a free spreadsheet. Call 081-336 1282. ■

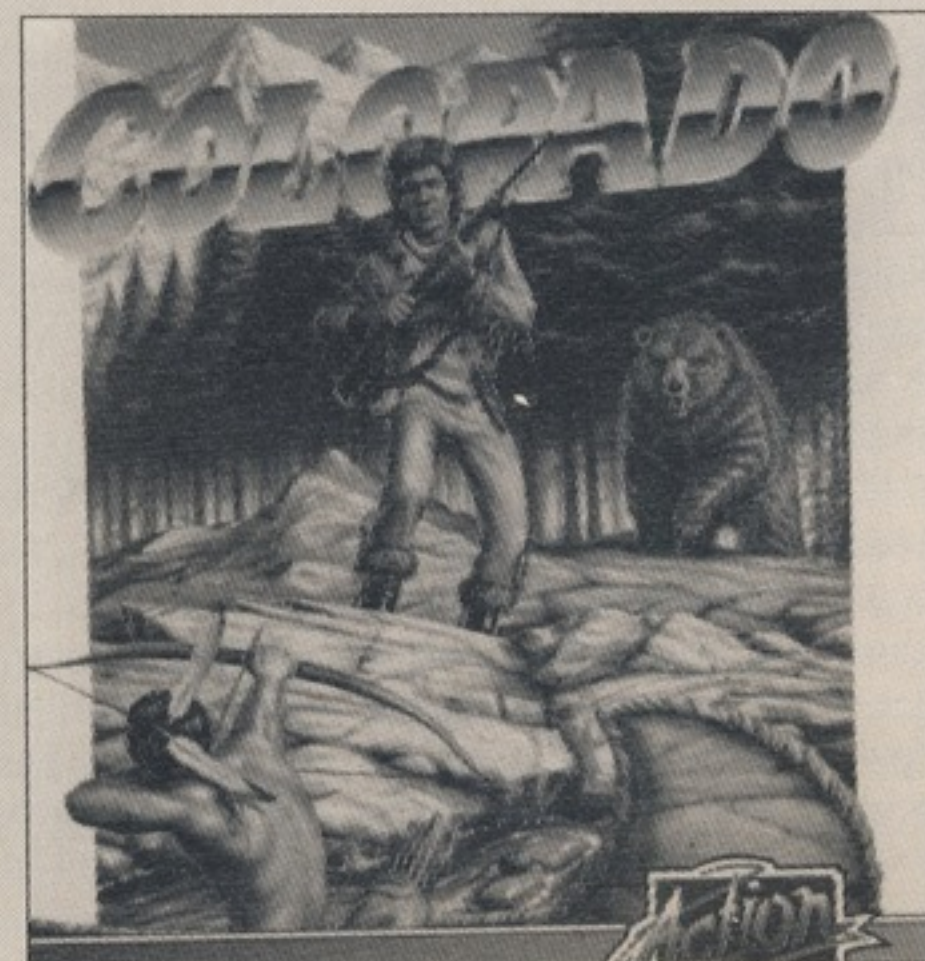
Budget 16-bit action

Digital Integration is releasing *Super Gridrunner*, *Colorado* and *SDI* on its budget 16-bit label, Action 16.

Colorado is a western adventure pitting you against 'Injuns' and wild animals. A love story set against the background of international espionage provides the premise of *SDI*. If science fiction 'shoot-em-ups' are more your taste then *Super Gridrunner* will provide all the action you need as you fly a Vorton Hyper X-13 star fighter to save the earth from the "evil Slimelords of Xtharrgg".

All three disks are out now for the Atari ST and Amiga, *Colorado* also being available for the IBM PC. They each retail at £7.99.

Digital Integration has also, finally, issued a Spectrum version of the acclaimed game *F-16 Combat Pilot*. This classic flight simulator, with five missions, variable weather conditions and laser guided weaponry, is due in the shops now. The disk version costs £19.95 and the tape retails at £14.95. ■



• Colorado: Wild West action.

Dealers told to dispose of old computers and offer £70-off deal

TRADE IN YOUR 8-BIT FOR A NEW AMIGA 500

Buyers of Commodore's Amiga are to be offered an impressive trade-in deal on their old computers.

Anyone can swap their outdated machine for a £70-off deal on the Amiga. Dealers say the offer is open ended and will include games consoles and dilapidated computers.

The £70-off plan will bring the price down from £399 to £329. While dedicated users of 8-bit machines such as the Speccy and C64 will be horrified by Commodore's announcement, genuine computer users looking for a good deal will be attracted.

The dealers have been

instructed to dispose of old computers, but Commodore says it would be nice if they were given to charity. Commodore's Kelly Sumner said: "We can't force the dealers' hand, but we have given them that option."

Cynics in the trade were last week claiming that the Amigas are old faulty returns which had been fixed and were being dumped back into the market. Sumner assured *Express* that this was not the case adding: "That is totally illegal, and we would not do such a thing." The Amigas on offer do not include the free software packs.

Meanwhile, the mid-range



• *Amiga: tasty trade-in deal.*

Amiga 1500 pack has been cut in price by 15 per cent – effectively changing the £999 plus VAT to £999 including VAT.

Commodore has also announced its middle of year financial results showing that the UK operation is performing bet-

ter than anywhere. Sales were up more than 50 per cent in the UK for the period running up to Christmas (on the same period in 1989). Chairman Irving Gould said Europe now represents 85 per cent of Commodore's worldwide business. In contrast the American operation reported a 97 per cent drop in earnings.

He also claimed that the new PCs introduced last year had performed well, but said it had been the Amiga's success which had represented an upswing in sales and profits. More IBM compatibles are expected to be launched in the UK within the next few weeks. ■

From another planet . . .

The third issue of Californian New Edge computer magazine *Mondo 2000* has hit the UK. The more Virtual among you will remember *Mondo* for its off-the-wall approach to computing and its plain weirdness.

This quarter's issue features reviews on hardware, software, graphics and computer art, debates on Virtual Reality, interviews with strange new-tech types and lots of laughs. The publishers say it's one for computer literate dissidents.

You can pick it up from Virgin Megastore in Oxford Street, London or Forbidden Planet in New Oxford Street, London for £4.75. ■



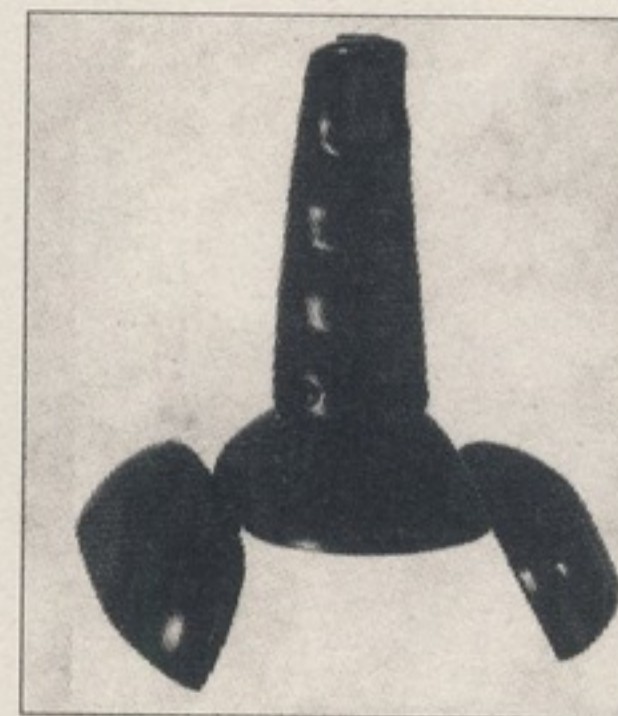
• *Mondo 2000: strange*

Unix ST?

Atari is believed to be preparing for the launch of a high-end ST running Unix.

A spokesman for the firm confirmed that launches are in the offing, and said the company is looking closely at Unix. He could not, however, comment on speculative talk that the machine would be 100 per cent downwardly compatible with the ST.

Meanwhile, expectations are growing of a new pricing structure for the whole ST range. The spokesman refused to be drawn on this speculation. ■



• *Converta: two in one*



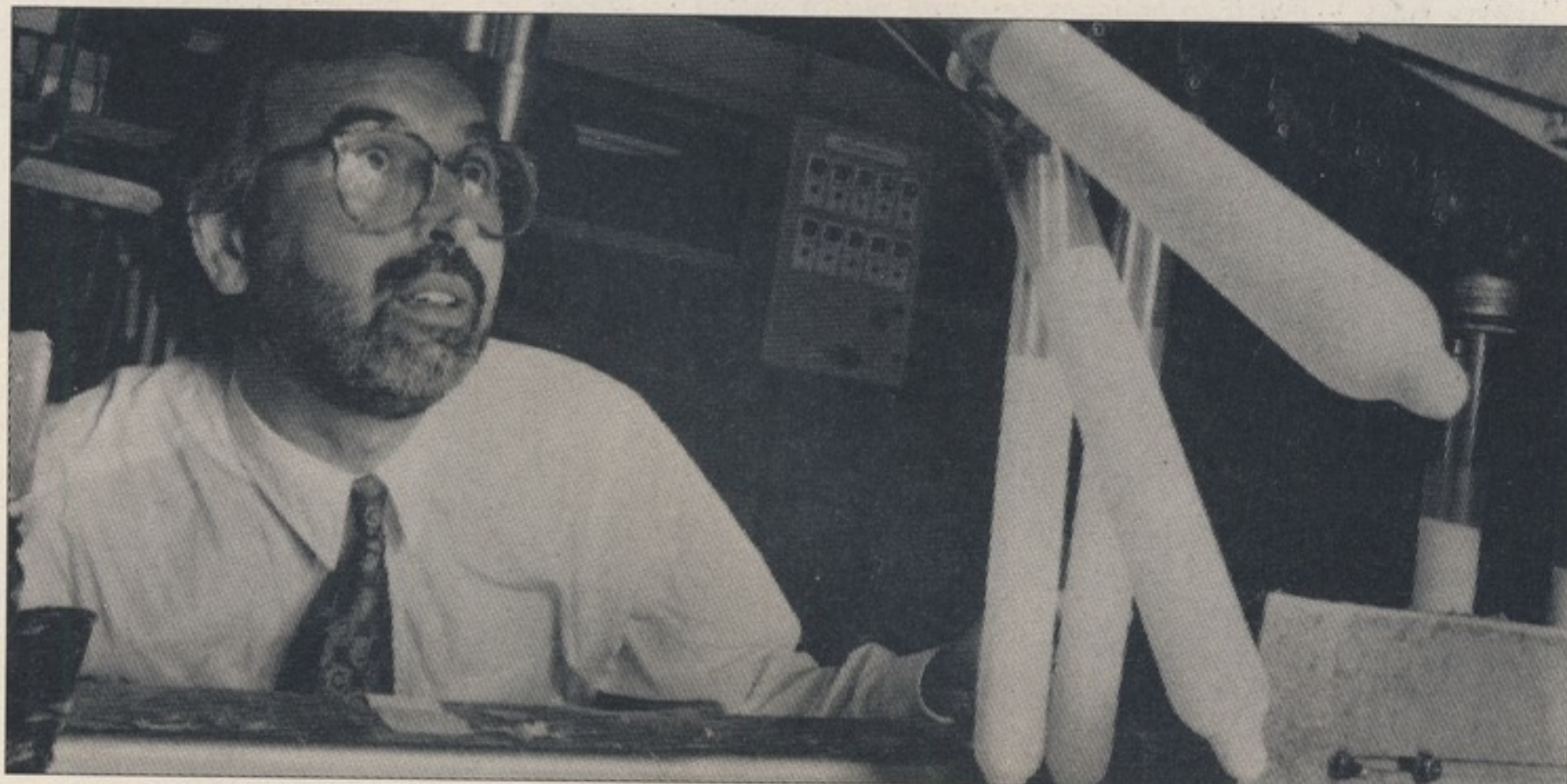
Open and shut joystick

It's the world's first convertible joystick, and it's being launched this week.

Converta allows gamers to choose between hand-held use and table-top use, giving you a little advantage depending on

what your style happens to be.

Converta is manufactured by KPK (a Welsh firm set up by computer industry veterans). It's compatible with most home computers, and it costs £9.99. Call 0495 302968. ■



• The London International Group, famous for the manufacture of rubber gloves and Durex condoms, has just splashed out £200,000 on a new computer system designed to improve the making and testing of its products.

The IBM based system replaces an outdated mainframe, the company says the new machines will "provide greater flexibility for users".

Soviet silicon valley planned

Senior executives from top American computer companies have been visiting the Soviet Union recently for meetings with president Mikhail Gorbachev.

The Soviets are keen to set up a new "silicon valley" in their own country and are seeking advice from firms such as IBM and Apple. In turn, the Americans are looking for Gorbachev to throw some business their way.

Six possible sights have been chosen, and a final decision should be taken later this year. ■



• *Gorby: in with IBM and Apple*

Society of Software Authors holds second annual conference

BLEAK FUTURE FEARED FOR GAMES WRITERS

by Dave Golder

At the second conference of the Society of Software Authors (SSA) games writers voiced fears of a bleak future with little creative control and sweatshop working conditions and admitted that the initiative for change will have to come from themselves.

Software writers are in danger of ending up salaried skivvies working on formulaised projects in publishers' sweatshops unless they get their act together and take a more professional approach to their work, the SSA claims.

At the Bournemouth conference the resounding message from speakers was: "The writers have got to prove that they can work professionally or they will never get a good deal from the publishers."

As SSA Chairman Jon Dean put it: "A lot of software writers aren't even aware that they're running a business. Authors are good at programming or graphics, but that doesn't automatically give them the skills at negotiating a contract. Publishers can handle this side of things much better because it's part of their business and they're doing it all the time."

The speakers also emphasised that a business led software industry would inevitably lead to a raw deal for the consumer, who would have to put up with uninspiring games and endless sequels.

Mel Croucher, software writer and industry veteran, painted a particularly dark picture in his speech, coining the sweatshop analogy which was to crop up as a theme in many of the following speeches. He fears that if current trends continue, authors will soon have little creative input into games and most will instead be reduced to writing short routines or animated sequences handed down to them by the publishers.

Although opinions varied on the extent



• Tom Watson (right) with the Bitmap Brothers: good business sense could preserve their distinctive style of games.

to which this hypothesis would be realised, most agreed that the general idea was looming ominously.

"I think the situation is here to some extent at the moment," believes Dean, "You have a few the well-known programmers like Renegade's Bitmap Brothers who are largely free to do what they want, but the majority of creative people have to take whatever they can get."

The SSA is a voluntary body which was set up three years ago with the intention of achieving a better deal for games software writers. At the moment it has around 50 members, an annual AGM every March and publishes a quarterly newsletter, *Blit*. New members have to sign a 'Declaration of Responsibility'. Dean reckons that the main function of the society is "to help the writers help themselves," but it is keen to stress that it is not a union.

"We're not out to call a strike or hold a gun to the publishers' heads," asserts Dean. "We've got to achieve our aim with the support of the publishers, acknowledge that there can be faults on both sides. We want to end the situation where publishers and authors work in isolation and blame anything that goes wrong on each other."

The feeling at the conference was that there are two main ways that the authors can help themselves improve the situation. Tom Watson of Renegade spoke of the value of authors developing an identity so that their own name would become the marketable commodity. Using the example of Renegade's own Bitmap Brothers, creators of *Xenon* and *Speedball*, he argued that if the games buyers know who wrote their favourite

software as opposed to simply who published it, this would create a kind of brand loyalty, such as with fans of one game written by the Bitmap Brothers eagerly awaiting the next.

He believes that this will give the authors more bargaining power when it comes to negotiations with publishers. "So the companies might just lose a little of their power, but in the end result is a

situation which is better for both sides."

Dean agrees to large extent, but points out that The Bitmaps actually have a major stake in Renegade, and

"there's a big difference between developing your own identity and having your own label."

He doesn't feel that authors have to go this far to succeed. "There is more positive than negative to come out of having an identity. More authors get coverage now - names on boxes, mentions in magazines. We are pushing to have them credited at the annual industry dinner. When the awards are read out I would like to hear 'The winner is *Captive*, from Mindscape, written by Tony Crowther."

He doesn't think that developers having an identity is necessarily at the expense of the publishers. "Take Bullfrog and Electronic Arts. Bullfrog has written some very good games, the quality shows through and the consumers have recognised that. It has been a good move for them both." But at the same time he is not convinced of the value elevating writers to star status. "Authors aren't usually as good looking as pop stars."

Dean's own view is that authors simply need to take a more professional approach to their work, and stresses that one of the main functions of the SSA is to

help them do just that. "The aim of the conference was about teaching them the business side of things. If they can negotiate a better deal that's a start."

His own talk was about the need for authors to impose business management techniques on their writing schedules and he emphasised that it would be to their own advantage to be honest both with publishers and with themselves when it came to discussing the amount of time a game will take to write.

"There are publishers who will claim that they have been ripped off just because a game has been handed in late. This is just down to bad business management. It is hard for authors to admit that they might take longer than the ideal length of time to write a game. What both sides need to do is plan better."

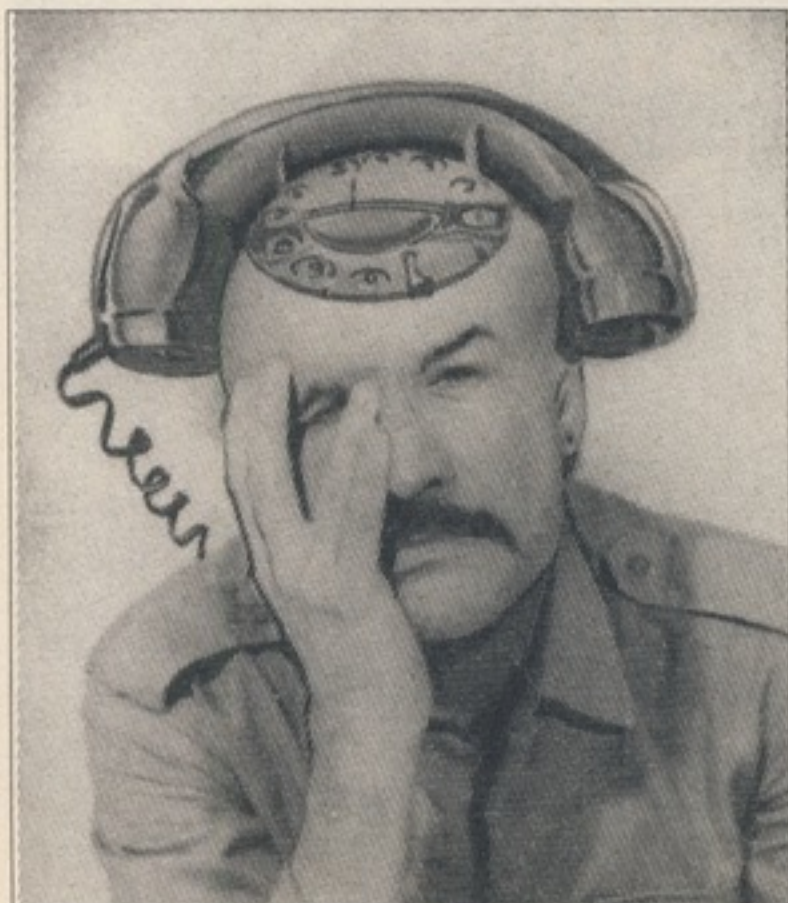
Dean is pleased at the way the conference ran. "It was probably about 150 per cent better than the last one and hopefully the next one will be 150 per cent better than this one."

He was also pleased to see representatives from four of the major publishing companies there, including Microsoft and US Gold and believes that the society is finally gaining recognition. "We recently had a meeting with ELSPA - the publishers' association - and it has agreed to support us, so I suppose that means that it has officially recognised us."

"Getting our message across has been hard as people tend not to take us seriously. We find it hard to get coverage, but finally we are seeing change."

So while the SSA is not a pressure group making a song and dance, demanding rights for authors, Dean is convinced that its long term approach working in conjunction with, and not against, the publishers is proving successful. "Change will only come if all the people involved on both sides put as much effort into it as possible and the results will be better for both the consumer and the industry."

The SSA helpline is on 0867 35485.■



Industry veteran Mel Croucher casts some very gloomy predictions at the conference about writers submitting to the beck and call of the publishers.

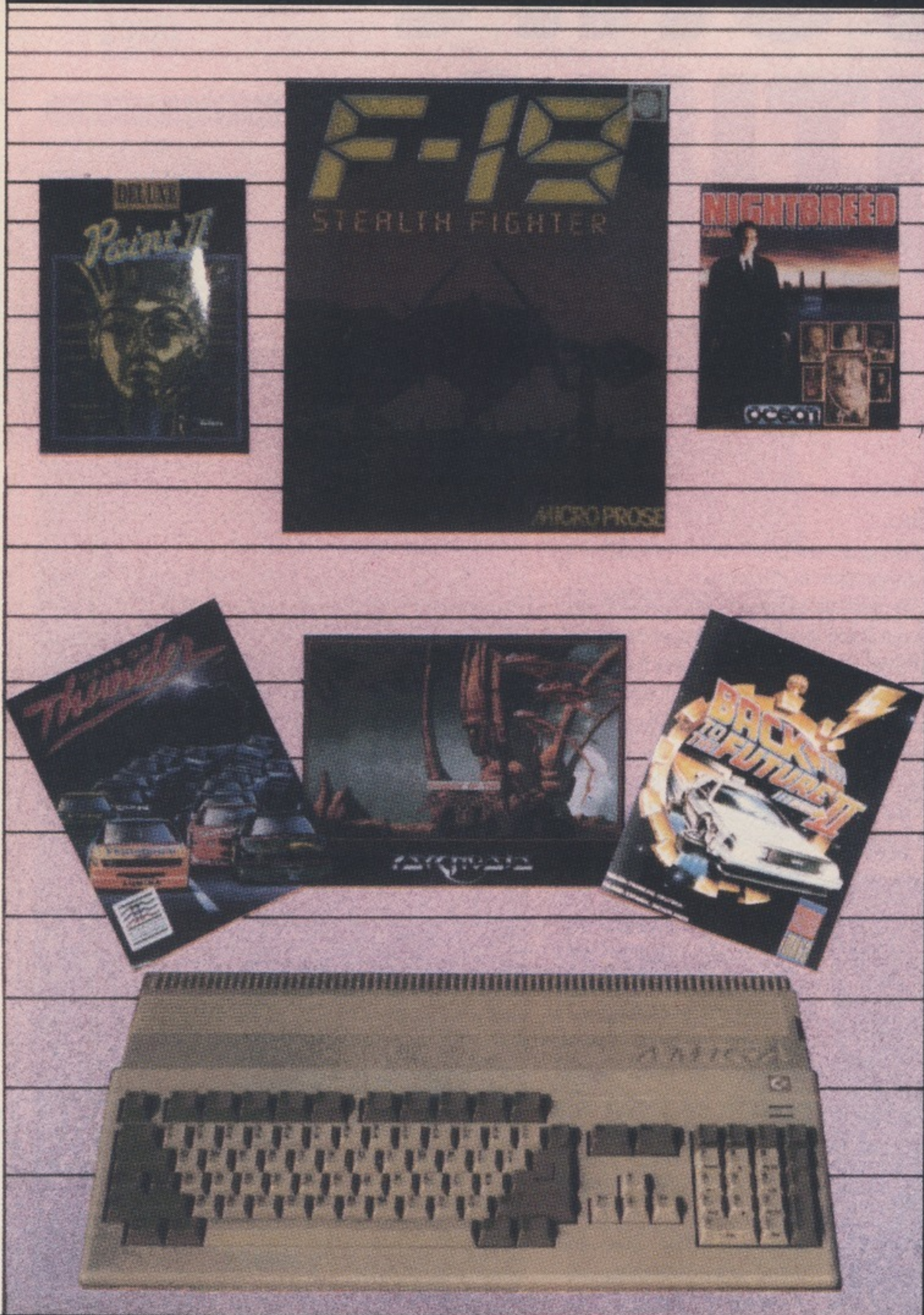


Jon Dean, SSA chairman: "We must help software authors to help themselves."

NEW

Commodore SCREEN GEMS

**AMIGA™
500**



**SCREEN GEMS is
the only NEW
Official Amiga A500 pack
from Commodore !**

pack includes

- ✓ Amiga A500 Computer Keyboard
- ✓ 512K Random Access Memory
- ✓ Built-in 1 meg double-sided disk drive
- ✓ Superb 4096 Colour Graphics
- ✓ 4 Channel Digital Stereo Sound
- ✓ Speech Synthesis
- ✓ Multi-Tasking Operating System
- ✓ Kickstart 1.3 and Workbench 1.3
- ✓ Three Owners Manuals
- ✓ Extras 1.3 and Tutorial Disk
- ✓ Amiga BASIC Programming Language
- ✓ Notepad Mini Word Processor
- ✓ Commodore Mouse
- ✓ Power Supply Unit with mains plug
- ✓ TV Modulator
- ..and all connecting cables to get you up and running on your home TV set!

plus

- ✓ Shadow of the Beast II
- ✓ Days of Thunder
- ✓ Back to the Future II
- ✓ Night Breed
- ✓ Deluxe Paint II Art Package

plus FREE DIGISTAR pack

10 great software titles and accessories worth over £235 - Only from DIGICOM!

- | | |
|--------------------------|----------------------|
| ✱ Microprose Soccer | ✱ Grand Monster Slam |
| ✱ RVF Honda | ✱ Powerplay |
| ✱ Kid Gloves | ✱ Tower of Babel |
| ✱ Datastorm | ✱ Shufflepuck Cafe |
| ✱ Dungeon Quest | ✱ E-Motion |
| ✱ Microswitched Joystick | ✱ Mouse Mat |

and exclusive to DIGICOM!!!

F-19 Stealth Fighter

The Ultimate Flight Simulator game from Microprose worth £34.99!

**Total package price includes VAT and Next Day Delivery by Courier*
Don't delay - Order now! 24Hour Credit Card Hotline Telephone (0908) 378008**

How to Order



By Phone - Call our Credit Card Order line on (0908) 378008 and quote your card number and expiry date along with the details of the goods you require. We accept ACCESS, VISA, EUROCARD, MASTERCARD, AMEX the new Direct Debit cards like Barclays Connect and we also accept Lombard CreditCharge Cards.



By Mail - Simply write down your requirements and send in your order to us by post along with a personal cheque, bankers draft, building society cheque or postal order made payable to "DIGICOM COMPUTER SERVICES LTD".
*Please note:- Personal cheques require 7 days clearance before despatch.

Next Day Delivery is Mon-Fri, Saturday Delivery is £3.00 extra

Catalogues!

Ring or write in for our latest Amiga catalogue listing hundreds of products available for this versatile Home Computer. We stock COLOUR PRINTERS, STEREO COLOUR MONITORS, EXTERNAL DISK DRIVES, MEMORY EXPANSIONS, HARD DISK DRIVES, AMIGA BOOKS, FRAME GRABBERS, DIGITISERS, SCANNERS, WORD PROCESSORS, DATABASES, SPREADSHEETS, ACCESSORIES and of course hundreds & hundreds of games and all at well below recommended retail prices!

Service you can depend on!

Digicom offer you the very best in customer after sales support with 12 month warranty on all Computer Hardware. All units are full UK specification with 30 day replacement guarantee on faulty items and FREE collection of the defective units within this period. And should you ever need any technical advice our experienced and helpful staff are available on the telephone or in our showroom. Remember - there are no hidden extras all prices are fully inclusive of VAT and next day courier delivery. Prices & Specifications are subject to change without notice E&OE.

only.....

£399

✱ or spread the cost with our finance facilities - written details on request.

DIGICOM

36-37 Wharfside Watling Street
Fenny Stratford Milton Keynes MK2 2AZ
Telephone (0908) 378008 - Fax (0908) 379700
Showroom Hours - Mon to Sat
9.00am-5.30pm

SUPERSONIC COMPUTING

Supercomputers are breaking new speed records every day, but how do they do it and can the same techniques work on your machine?

The overriding criterion to influence computer design ever since the first mainframes lurched into life in the Sixties has been speed. The search for faster and faster machines has continued for the last decades, finally resulting in the supercomputers we know today.

But the quest for speed has not ended; indeed if anything it has intensified in the last few years. As the potential of simply boosting the computing speed by creating faster hardware has bottomed out due to the limits of the laws of physics, alternative approaches have been brought in to action. These approaches centre around different computer architectures. 'Architecture' is the name given to the layout of components of a computer, but more importantly it defines the way data is transferred and processed by the machine.

The original computers were sequential; the processor received its instruction from a program, it then input the data from memory, processed it according to the instruction and sent the result back out to memory. The first enhancement to this came in the form of pipelining. A processor consists of several parts; the bit which gets the instruction, the bit that gets the data, the bit that does the processing, and so on. Using pipelining, while one part of the chip is processing an instruction, another part is loading the next one in ready to be done. This can speed up operations enormously.

One step further on than pipelining is vector processing; in this case when a set of instructions are to be applied to a large amount of data each step is performed simultaneously on all the data. This is speedier than taking each piece of data individually and putting it through the complete set of instructions, as the processor can be optimised for each instruction and does not have to reset itself for the next until all the data has gone through. Vector processing is the most common architecture in supercomputing systems.

To increase performance over vector processing systems requires a radical change in the machine's architecture. No longer is one processor enough; instead the problem is broken into several parts which can be worked on simultaneously. The processors in machines like this operate in parallel, and communicate

with each other to transfer data and to allocate pieces of code to each other.

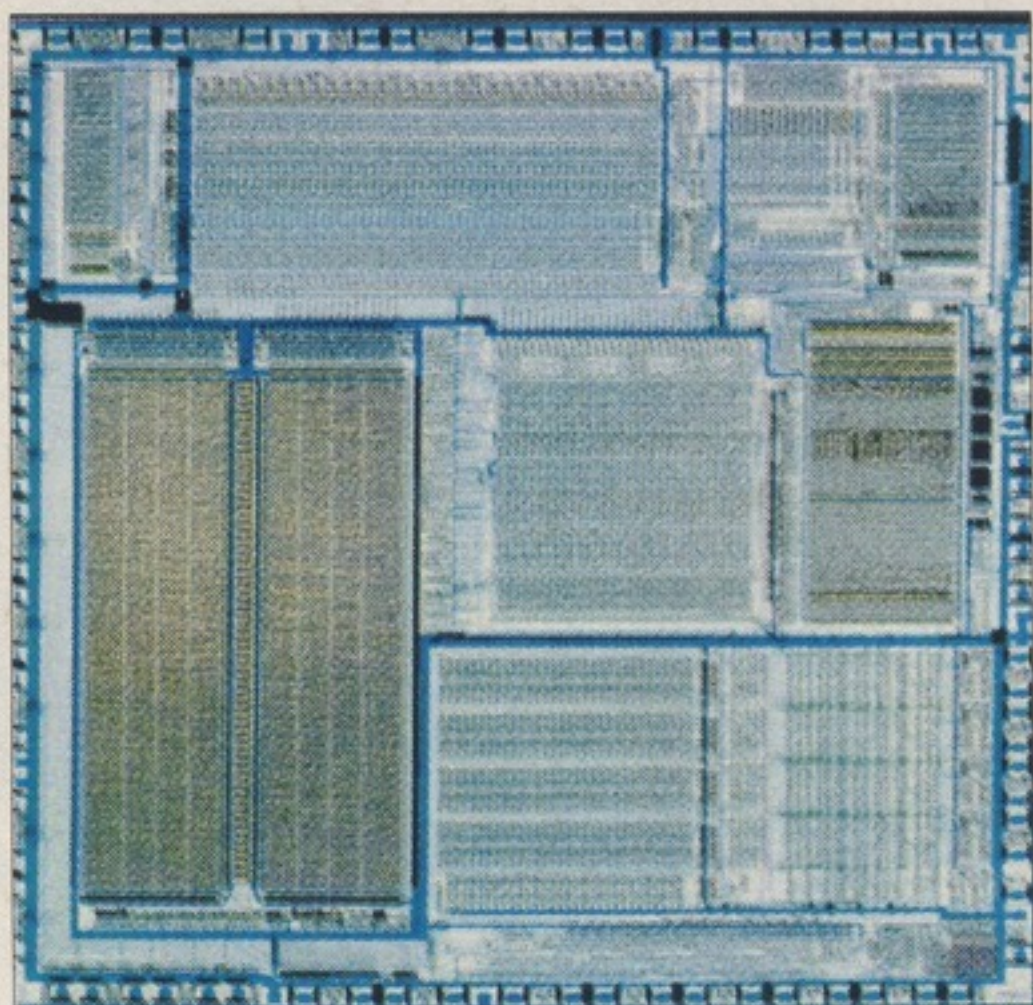
With a parallel processing computer the power is only limited by the number of processors, called nodes, which you add. Thousands of these chips can be strung together, and even if the individual processors are not that powerful, the net effect is stunning. Take the Sigma system, a parallel processing computer consisting of 2,048 i860 processors, each one as powerful as a 486, combining to give awe-inspiring power.

The problem with this kind of machine is programming it. The problem must be analysed in such a way as to be broken down into constituent parts which can be calculated by the nodes. The code to make sure that the nodes communicate with each other properly also needs to be written. Conventional sequential programming methods cannot be used; you need special compilers, but more importantly alternative ways of looking at problems.

These parallel architectures are coming to home computers. The way the Amiga works with its custom sound and graphics chips approaches parallelism, but it is Atari which takes the prize for bringing the technology to the desktop. The Atari TT is to have a card which can

contain up to four T-800 transputers working in parallel, similarly a new version of the Atari Transputer Workstation will allow several T-800s to be wired together. In the PC world, expansion cards are available which contain up to eight parallel processors. Some manufacturers have also started to build multiple 386 processors into their file server machines to increase their power. All these systems require special software; conventional software won't run any faster with a parallel processor board.

The power of parallel processing cannot be long coming to home machines. Imagine the games machine which could be built; one processor handling the graphics, another dealing with sound, a third working out whether your shots had hit, and a fourth loading in the next level from a disk, all at the same time, all at high speed. The cost of microprocessors is now so low that there is no financial reason why this could not be done; perhaps by the year 2000.... ■



• The Inmos T-800 transputer is the powerhouse behind many parallel processing computers; you'll find these inside the ATW and they can be fitted to PCs and TTs.

GLOSSARY OF SUPERCOMPUTING TERMS

ARCHITECTURE: The arrangement of processors, memory and communication links which makes up a computer.

BOUDOIR: Each parallel process accesses only its own memory.

CLOCK CYCLE: The speed at which instructions are performed by the processor. The current record holder is NEC SX-3 with 2.9 nanoseconds.

DANCE FLOOR: Each parallel processor can access all the others' memory.

DISTRIBUTED COMPUTING: Several supercomputers with different architectures linked together, the appropriate machine being used for each kind of task.

GALLIUM ARSENIDE: Material for making microchips which can operate considerably faster than ordinary silicon. Expensive to manufacture.

HYPERCUBE: System of linking parallel processors to three neighbours, all further linked as if at the corners of a cube.

MESH: Interconnections between nodes of a parallel supercomputer.

MIMD: Multiple Instruction Multiple Data: A system whereby each parallel computer element has its own program. Much faster than SIMD, but very difficult to program.

NODE: Processor, often with its own memory and instructions, in a parallel supercomputer.

PARALLELISM: Rather than make one processor that runs faster, split the problem into several parts which can be worked out simultaneously and have a number of processors working together to solve the problem.

PIPELINING: A system whereby different parts of a processor can work on several problems simultaneously, starting the next one before the first has been completed.

SIMD: Single Instruction Multiple Data. A form of parallelism where the instructions are held in a single program which works with several sets of data at once using several processors.

TERACOMPUTER: a fictitious supercomputer with a terabyte of RAM, a teraFLOP of computing power and a data transfer speed of a terabyte per second. At present no-one has got close to a machine of this specification, but work continues apace.

TRANSPUTER: A kind of processor which can be linked together to form a parallel system. Inmos manufactures the most common, the T-800.

VECTOR PROCESSING: If a set of operations are to be performed on a large amount of data then each operation is done on all the data simultaneously, rather than taking the process to completion for each one. The architecture of 'standard' supercomputers.

24-HOUR SERVICE
OPEN: MON - FRI 9.00 - 5.30
SATURDAY 10.00 - 2.00

Business Technology Centre

PHONE OR FAX: 0282 831900

SEIKOSHA SL92
 24 PIN 42K BUFFER 9 FONTS
£299 INCLUDES ON-SITE WARRANTY

DOT MATRIX PRINTERS

9 PIN 80 COLUMN	draft/nlq	£
STAR LC-10	144/36	125
STAR LC-10 colour	144/36	166
STAR LC-10 colour comm 64	144/36	166
CITIZEN 120D PLUS	120/25	105
CITIZEN 120D PLUS comm 64	120/25	105
CITIZEN PRODOT 9	300/60	265
SEIKOSHA SP2000 (21k buffer)	200/40	199*
SEIKOSHA MP1350	300/50	359*
PANASONIC KXP 1180	192/36	139
MAN. TALLY MT 81	130/26	104
OLIVETTI DM 100SPR	200/30	119*
EPSON LX 400	180/30	135

9 PIN 136 COLUMN		
STAR LC-15	180/45	255
CITIZEN PRODOT 9 x	300/60	345
PANASONIC KXP 1592	216/45	255
SEIKOSHA MP5350	300/50	499*

24 PIN 80 COLUMN		
STAR LC24-10	170/57	195
CITIZEN SWIFT 24	192/64	239
CITIZEN PRODOT 24	200/60	369
PANASONIC KXP 1124	192/63	219
SEIKOSHA SL92 (42k buffer)	240/80	299*

24 PIN 136 COLUMN		
STAR LCX24-15	200/67	325
STAR XB24-15	240/80	510*

*ALL DOT MATRIX PRINTERS MARKED WITH A * INCLUDE A ONE YEAR ON-SITE MAINTENANCE CONTRACT.

A ONE YEAR ON-SITE MAINTENANCE CONTRACT IS ALSO AVAILABLE FOR MOST OTHER DOT MATRIX PRINTERS - ONLY £16.

A FULL RANGE OF SHEET FEEDERS, TRACTORS, ACCESSORIES AND CONSUMABLES ARE ALSO AVAILABLE FROM STOCK - CALL FOR DETAILS.

SWIFT 24 COLOUR
 24 PIN PRINTER INC. COLOUR KIT
£269

TERMS

ALL PRICES EXCLUDE VAT.
 PRICES AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.
 CALL TO CONFIRM BEFORE ORDERING.
 STRICTLY CASH WITH ORDER.
 ACCESS, VISA AND AMERICAN EXPRESS WELCOME.
 POSTAL ORDERS, CHEQUES AND BANKERS DRAFTS ACCEPTED.
 OFFICIAL ORDERS FROM EDUCATIONAL AND GOVERNMENT ESTABLISHMENTS, CORPORATES AND PLC'S WELCOME.

DELIVERY

ALL GOODS NORMALLY DESPATCHED WITHIN 24 HOURS FROM RECEIPT OF CLEARED PAYMENT - subject to stock availability.

PC'S AND LASERS	£15.00	NEXT DAY DELIVERY
OTHER LARGE ITEMS	£10.00	NEXT DAY DELIVERY
SMALL ITEMS	£5.00	4 DAY DELIVERY

WARRANTY

ALL GOODS CARRY MANUFACTURERS WARRANTIES.
 ON-SITE WARRANTY AVAILABLE ON MOST DOT MATRIX PRINTERS AND PC'S - CALL FOR DETAILS.
 TECHNICAL SUPPORT AVAILABLE. E. & O.E.
 Goods not offered on trial basis.
 Goods are offered for sale subject to our standard terms and conditions of sale - available on request.
 WE STOCK MANY MORE PRODUCTS - CALL FOR DETAILS.
 LARGE STOCKS OF FLOPPY DISKS AND RIBBONS CARRIED.



NON-IMPACT PRINTERS

		£
SEIKOSHA	OP105 LED (desktop size, takes legal paper)	1299*
STAR	LASER 8	1179*
STAR	LASER 8 DUAL BIN	1599*
H. PACKARD	LASERJET II	1199*
H. PACKARD	LASERJET III	1299*
OLIVETTI	PG 306	899*
CANON	BJ130 INK JET	519

ONE YEAR ON-SITE MAINTENANCE IS INCLUDED IN THE PRICE OF ALL THE ABOVE PRINTERS MARKED WITH A *.

A FULL RANGE OF TONERS, FONTS, MEMORY CARTRIDGES, INK CARTRIDGES AND OTHER ACCESSORIES ARE STOCKED - PLEASE CALL FOR FURTHER DETAILS.

OLIVETTI PG306
 LASER PRINTER
£899 INCLUDES ON-SITE WARRANTY

PLOTTERS AND SCANNERS

HITACHI	681	A4/A3 PLOTTER	520
HITACHI	674	A4/A1 PLOTTER	2149*
(includes one year on-site warranty)			
PANASONIC	FX-RS505	SCANNER	919
(with I/F card, cables, IMAGE AND OCR software)			
NISCAN	HAND SCANNER		139
NISCAN	OCR software		189

DRIVES

CITIZEN	OSDD 05A-WD	3.5" 720K in 5.25" KIT	59
CITIZEN	OSDA 39C-WD	3.5" 1.44mb in 5.25" KIT	69
CITIZEN	OSD 76A-WD	3.5" 720K AMSTRAD KIT	59
INTERNAL	5.25" 1.2mb		59
INTERNAL	5.25" 360K		69
JAVELIN	HC20	20mb XT HARD CARD	185
JAVELIN	HC30	30mb XT HARD CARD	199
FILECARD	HC40	40mb AT HARD CARD	229
KYOCERA	KC 20B(s)	20mb XT/AT DRIVE, 3.5"	138
KYOCERA	KC 30B(s)	30mb XT/AT DRIVE, 3.5"	158
KYOCERA	FRAME	5.25" kit for 3.5" hard drives	5

DRIVE CONTROLLERS AVAILABLE - CALL FOR DETAILS.

CABLES AND ACCESSORIES

PRINTER CABLE	1.8 metre	8
PRINTER CABLE	3.0 metre	9
SERIAL CABLE	1.8 metre	10
T SWITCH	2 way serial	18
T SWITCH	2 way parallel	18
T SWITCH	2 way serial crossover	25
T SWITCH	2 way parallel crossover	25
BUFFER	64k in-line	79

ACORN A3000
 1Mb RAM KIT
£89

COMPUTERS

ALL OUR COMPUTERS INCLUDE A MONITOR.

COMMODORE

ALL MODELS INCLUDE ONE YEAR ON-SITE MAINTENANCE

	MONO	CGA	VGA MONO	VGA COLOUR
	£	£	£	£
PC 10 SD	485	615	635	725
PC 10 DD	535	665	685	775
PC 20 HD20	675	795	845	945
PC 30 HD20			967	1128
PC 40 DH40			1229	1379

COMMODORE SPECIAL
 PC 10SD INC 40MB DRIVE & MONITOR
 INCLUDES ON-SITE WARRANTY
 MONO CGA MONO COLOUR
£699 £829 £849 £949

SAMSUNG

ALL MODELS INCLUDE ONE YEAR ON-SITE MAINTENANCE

	MONO	VGA MONO	VGA COLOUR
	£	£	£
SPC 3000 SD	483	589	789
SPC 3000 DD	569	659	859
SPC 3000 HD20	739	839	1039
SPC 6512 DD		919	1119
SPC 6512 DD HD40		1109	1309

HYUNDAI

	MONO	EGA	VGA MONO	VGA COLOUR
	£	£	£	£
16TE SD	419	699		
16TE DD	459	759		
16TE HD30	619	919		
286x SD			639	819
286x HD40			939	1119

HYUNDAI 16TE
£419 MONO XT AND MONITOR
HYUNDAI 286X SD
£1099 HD 40 AND VGA MONITOR

PORTABLES

SHARP	4602	DD	789
SHARP	5541	286 HD40	2099
SAMSUNG	S5200	286 HD32	1707*

(includes on-site maintenance)
NOW IN STOCK
SHARP 8041 & 8081 386 LAPTOPS - CALL FOR PRICES.

SHARP 5541
£2099 HD 40 286 LAPTOP

THIS IS ONLY A SMALL SELECTION OF THE PC'S THAT WE SELL - CALL FOR FURTHER DETAILS.

PHILIPS CM9053
EGA MONITOR
£249 INCLUDES ON-SITE WARRANTY

MONITORS

			Price £
MONO	HYUNDAI	HMM1200	12" 65
MONO	PHILIPS	BM 7513	12" 69
MONO	PHILIPS	BM 7913 FST	12" 80
MONO	SAMSUNG	MA 2671	12" 81
MONO VGA	PHILIPS	BM 7749 FST	12" 107
MONO VGA	SAMSUNG	ML 2611	12" 81
MONO VGA	SAMSUNG	ML 4571	12" 95
MONO A4	SAMSUNG	MP 5671	A4 634
(includes card and software)			
CGA	PHILIPS	CM 8833	14" 199
EGA	PHILIPS	CM 9053	14" 249
EGA	PHILIPS	CM 9073	14" 289
EGA	SAMSUNG	CM 4551	14" 281
VGA	PHILIPS	3CM 9809	14" 325
VGA	SAMSUNG	CJ 4581	14" 281
MULTISYNC	SAMSUNG	CT 4581	14" 340

ALL MONITORS INCLUDE ON-SITE WARRANTY EXCLUDING THE HYUNDAI HMM 1200.

MDA/CGA CARD with PRINTER PORT	45
MDA/CGA/EGA CARD	99
VGA CARD	129

UPGRADES AND ENHANCEMENTS

MDM2400 PC CARD MODEM
£135 INCLUDING SOFTWARE

AKHTER	MDM 2400 PC CARD MODEM	135
FAXTEL	FAX SWITCH (auto switches calls to fax or phone)	69
KEYBOARD 84	84 KEY UK LAYOUT XT	41
KEYBOARD 102	102 KEY UK LAYOUT XT/AT	52
RAM CARD	576K - XT	27
RAM CARD	2Mb - specify XT or AT	93
SERIAL MOUSE	includes DR Halo III software	38
MULTI I/O CARD	XT - RS232/printer/clock/games/floppy	54
I/O CARD	AT - RS232/Printer	54
I/O CARD	XT RS232	19
UPS	250W	199

MEMORY - call for prices of SIMM's, SIP's and DRAM's.

SUPERDEALS

SCHNEIDER	220 AT MONO PC SYSTEM	909
SCHNEIDER	20Mb HARD DRIVE KIT	199
HYUNDAI	360K DISK DRIVE	45
YE DATA	720K DISK DRIVE	49
SHARP	JX 9300 LASER PRINTER	949
SHARP	JX 720 INK JET PRINTER	649
MICROVITEC	1431 DS4 - BBC MONITOR	169
MICROVITEC	1451 MS4 - BBC MONITOR (metal case)	229
MICROVITEC	1456 DL2 - NIMBUS MONITOR	249
MIRACOM	COURIER HST MODEM 9600/ V22bis/V22/V21/V23 & MNP	539
IBM	MODEL 30-021	849
IBM	MODEL 50-061	1599

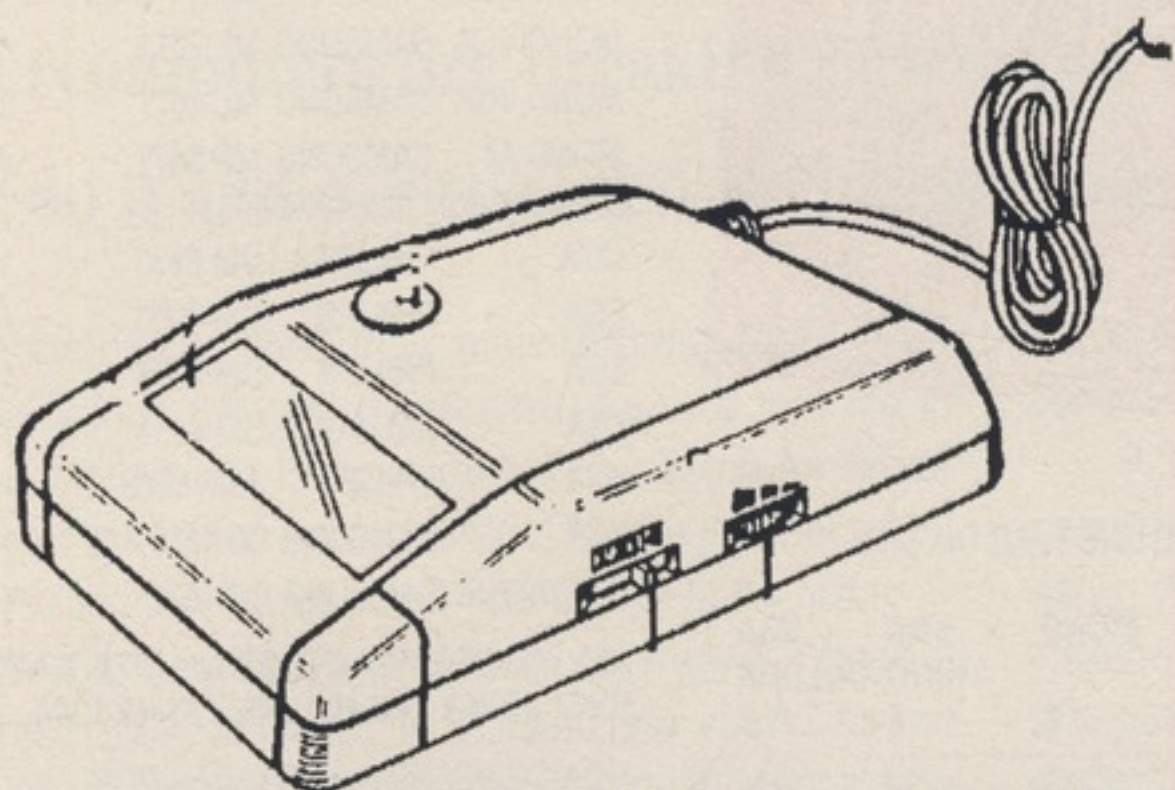
WE ARE AN ACORN EDUCATIONAL DEALER - CALL FOR PRICES.

Business Technology Centre

HOLE HOUSE FARM, BURNLEY RD, CLIVIGER, LANCS., BB11 3RF
Tel. & Fax: 0282 831900 (24 HOURS)

PC HAND SCANNER SCOOP

Manufactured in Korea by ACER. 3 resolution levels, 400/300/200 dpi selectable, Line Art & Halftones, 16 grey levels (Ideal for scanning Photographs). Now you can scan & edit logos, artwork, text, signatures, cartoons, photos etc. Files can be saved in .TIF (for Pagemaker). PCX (PC Paintbrush) and .MSP (for Windows Paint).



PLUS...Superimpose & Merge facility. The package contains the scanner, XT/AT scanner interface card, Studio Scan software, and full documentation. This product would normally cost £129.95 plus VAT, but our special price is just £89.95p inc VAT. (Postage £3.05p)

£89.95p

inc VAT
(postage £3.05p)

"BEST BUY
FOR 1991"



VISA/ACCESS orders welcome. Prices subject to change without notice. All transactions are subject to our standard conditions of Sale available upon request.



Personal callers welcome by appointment. All prices include VAT.

UK HOME COMPUTERS

Unit 22, Cheney Manor Ind. Est.
Swindon, Wilts SN2 2PJ

Tel: (0793) 695034
FAX: (0793) 541691

SCOOP PURCHASE

LASER PRINTER with in-built PHOTOCOPIER

RANK XEROX 4045R

- ★ Personal photocopying facility
- ★ 10 ppm fast Laser Printing
- ★ HP LaserJet+ Diablo, Xerox 2700 (FX80/IBM Pro. text)
- ★ 512KB & 1MB RAM versions - RAM memory expandable.
- ★ Resident, cartridge & Downloadable fonts - portrait and landscape.
- ★ Parallel and Serial Interface
- ★ 250 sheet Paper Tray A4
- ★ Cheap toner refills (4 supplied) £10 each, approx 5000 copies.

**WARRANTY - 3 months on-site
Service/Maintenance by Rank Xerox.**

£650

512KB RAM

£750

1MB RAM

NEXT DAY DELIVERY/ INSURANCE £30

TELEPHONE ORDERS,   ACCEPTED

All prices exclude VAT

Factory Refurbished/Exdemo stock
Current model, normally £3,995 + VAT

PHONE: 081-330 7533

FAX: 081 - 330 4838

COMMONSIDE HARDWARE SERVICES LTD

Unit 13, 193 Garth Rd,
Morden, Surrey, SM4 4LZ

CONTENTS

LETTERS	13	ST	26
MACINTOSH	16	EXPRESS ON-LINE	32
CPC	17	CENTREFOLD	35
AMIGA	18	CIRCUIT CITY	44
ARCHIMEDES	20	WHOLE WIRED WORLD	46
PC	21	TECH TIPS	48
C64	22	PROGRAMMING	51
SPECTRUM	23	THE PD COLUMN	54

**SHOPPING
EXPRESS**

THE VALUE-PACKED GUIDE TO YOUR MACHINE AND MORE

**EXPRESS MAIL**

Write and tell H F-W what you think about anything under the Sun! Reach him at: **Express Mail, 30 Monmouth Street, Bath BA1 2BW**. Sorry, no personal replies, even with an SAE, as we're too busy writing the magazine.

With your host Haydn - the man with the fivers to give away

■ Veiled threat?

Regarding Alan Gilholm's letter in *Express* 114 in which he complains about the use of the phrase 'Rich Bastard' I'd like to point out that this is not an isolated use of bad language. In particular, your ex-columnist Steve Carey was prone to certain choice words that in no way can be called 'a term of mild derision'.

In your reply, you made the point that in the case of 'RB', it injected humour into the article. Did it need this humour? Surely an equally 'funny' phrase could have been found?

In my capacity as computer editor for the children's paper *Early Times* I often redirect my readers to magazines to allow them to study articles in more depth than I can give. The article in concern would have been superb for reference (bear in mind that *Early Times* has a circulation of 50,000) and could have increased your sales. However, I could hardly recommend it to 8-14 year-olds with that term. Yes, I admit that they used language like that - and worse - in the playground, and I am no proponent of censorship. However, it has a more dramatic effect when written - particularly by people that they may look up to.

I do take all your points into account, but must agree with Mr Gilholm and say that the swearing in that case was far from necessary.

Incidentally, any of your readers who fancy a new computer may like to know that *Early Times* gives readers the chance to win an Atari ST every week.

Peter Orme, Computer Editor,
Early Times

I'm always very suspicious of people who start to make a point with phrases such as 'In my capacity as...' Peter - they're generally about to say some kind of 'positional power trip' on you (as my hippie brother used to say).

And the only trouble with the pseudo penalty we incurred by not being recommended to your readers was that by the time you had rushed into print with a recommendation to buy a copy of *Express* and the Gamers' Guide, it would almost certainly have left the newsagents' shelves and been replaced by the next issue!

Still, you make some fair points (especially about ex-seminary boy Steve Carey) and in the interests of glasnost I've let your plug slip through the net.

H F-W

■ Video naughties

Express has always taken a laudable stand against piracy of software, and the breaking of copyright laws - for this, you are to be commended.

But with this in mind, surely you should be against any action that involves a breach of copyright, and not only that concerning computer software? A few adverts have been published recently in the Goods Wanted section of *Shopping Express*, requesting home video recordings of programmes from BBC and BSB television.

Surely, this is inviting a breach of copyright? I was always under the impression that it was OK to record off-air for your own use, but that it was not permissible to record a programme and then cause it to be heard or seen by others, re-recorded or sold.

Surely, if you're against one type of copyright infringement, you should not condone or enable others to take place?

Steve Lee, Ramsey, Cambridgeshire

PS. Did anybody notice Tracey learning to word process on a CPC 6128 in *Birds Of A Feather* prior to Christmas? And if they did, could they tell me where the 'EXIT' (sic) key is on a 6128?

You've got us bang to rights there, Steve, and we can't even claim that society is to blame. Those video ads just slipped through while we were distracted by the giant pile of adverts offering pirate copies of games. They won't appear again.

And maybe we'll start forwarding these dodgy ads to FAST rather than just binning them - so take heed, you would-be pirates out there. Meanwhile, have a fiver for reminding us of our moral obligations (and spotting that 6128).

H F-W

■ Scuppering pirates

Where I live there is a large network of hackers - they belong to a club that pretends to be a 'law abiding' computer club, but it isn't.

I know some people who belong to this club and hack games - and I also know who supplies the club with a lot of the goods (games to hack, etc). This network is a pretty bad thing, and I have been thinking about telling FAST about it for a long time, but have never brought myself to do it. If I did tell FAST about this illegal racket, what would I have to do? Just make a phone call, or would I have to give FAST some substantial evidence? Also, would there be some kind of reward?

I own a Sega MegaDrive and buy all my games. If I buy my games, why shouldn't other people who own computers buy their own games?

Anon

Exactly. It's dead simple mate. Give FAST a ring on 0628 660377 and they'll explain what's needed. It's highly unlikely that they will ask you to get involved in undercover operations - just a few basic details should suffice. And who knows - there could well be a porky cash reward in it for you...

H F-W

■ Spaced out?

I have been reading the debate in your letters pages concerning the future of Virtual Reality and its social implications.

We have to look no further than the brilliant TV series *Red Dwarf*, or the accompanying book by Grant Naylor to get an insight into what could lay ahead.

There was a (computer?) game called *Better Than Life* which directly stimulated the nerve centres of the player (Game Head) whilst the player's body lay slumped and dying in some corner. The game protected itself in such a way that the player wouldn't even remember starting to play, and was virtually impossible to stop.

Of course, this all just crazy Science Fiction set three million years in the future...

Glyn Pollington, Wollacombe, Devon

Crazy Science Fiction? Just you try working for *Express* - sounds remarkably like *Better Than Life* to me.

H F-W

■ Budget reality

A few weeks ago I read in *Express* about Virtuality, the Virtual Reality system. Well, I had to laugh - you see, I have been enjoying Virtual Reality for several years now - and whereas Virtuality costs 20 grand, my system costs a paltry 50 quid.

Because of my extremely generous nature, I am prepared to tell all to your readers and put these over-priced merchants in their proper place. To build the undisputed Virtual Reality system in the world, simply pop down to your local Dixons and purchase a Casio FX-730P pocket computer. On your way home, nip to the newsagents and buy some Sellotape. Then, when you get home, simply place the computer screen in front of your eyes and Sellotape it to your head (I thought this might be coming - H F-W).

Now you are ready to enter the world

of Virtual Reality. When I first saw this 'jdk-endkenhshnenbtd' displayed, I was convinced that I had fallen into a bowl of Alphabetti Spaghetti and was drowning. Fortunately, all that had happened was that the Sellotape had come loose and stuck across my mouth....

If you are really rich, you could buy some double-sided sticky tape as well, and hey presto, you immediately have a fully-expandable Virtual Reality system – just stick those extra speakers and accelerator boards on as you need them. Magic!

If you have a really big head, it is possible to have quadraphonic sound, 24-bit graphics and the computing power of an N-Cube stuck to your bonce!

The slight drawback is that you have to write your own programs, but where's the fun in buying pre-written ones?

Russ Flaherty, Liverpool

Er, yes Russ. Sure you don't have daily trouble coping with ordinary reality?

H F-W

■ Misled – or misguided?

I have just read *Express* 116 and note that your columnist Robin Alway mentions the SAM Coupé User Group and gives an address in Berkshire. I would like to point out that INDUG is the largest SAM Coupé users' group – we are founder members of Team SAM and have supported the machine since its inception nearly three years ago. As members of Team SAM we work very closely with SAM Computers Ltd, although we are, of course, totally independent.

Only SAM Computers Ltd can sanction the use of the name SAM or SAM Coupé, and, as far as we are aware, no person or organisation has been given permission to call themselves the SAM Coupé User Group.

As I know you have a lot of SAM readers and would hate to see them misled by Robin's column, could you please clarify the situation?

R P Brenchley, Format Publications, 34 Bourton Road, Gloucester, GL4 0LE

Claiming that Robin has misled anyone by printing the address of a group calling themselves the SAM Coupé User Group is a bit rich, Mr Brenchley. And it would strike me as being a bit rich if SAM Computers Ltd started getting nasty about the use of the names SAM or Coupé in association with a user group – surely the machine can use all the support it can get?

But being the fair-minded fellow that I am, I took the trouble to print your address in full – but would point out that INDUG is a user group for Spectrum and SAM owners rather than a SAM-specific organisation.

H F-W

■ Many happy returns...

What a major Kurfuffle about Old Codgers! (Careful – I could get in trouble if you use language like that – H F-W.) I have been in computing since I was aged 69 and I don't see anything strange about it at all. I currently possess an Atari 520STFM, double drive, colour monitor and printer and my main interests are 3D, graphics and video digitising. And I hope to continue for a long time yet.

I shall be 74 on Monday 28th January, so by the time you receive this letter you can wish me 'Happy Birthday'.

R J Wilkinson, Darlington, Durham

Consider it done, RJ, and I've raided our stock cupboard for a piece of ST software by way of a birthday present. But are you our oldest reader? More claims coming up...

■ ...On your birthday

When I retired some time ago, my sole experience of computing was with the old ZX81 – this taught me some of the principles of BASIC. I then decided to 'upgrade' to a Spectrum Plus 3 which I kept for a

couple of years, and I still think it's a great little machine, for all its limitations. I am now the owner of a 520STFM, and have been making some progress with GFA BASIC in which I can now make some reasonable programs.

When I can acquire a reasonably-priced manual for 68000 assembly language, I intend to have a go at learning Assembler. All I can say to your older readers is 'carry on computing'; it should give you a great deal of fun.

Perhaps I should mention that my birthday is on 1st February, and I will be 72 this year.

A Vest, Chester-le-Street

Happy Birthday to you too, Mr V – a mystery prezzie is also on its way to you. There's one more contender for the 'oldest reader' accolade...

■ Unlucky with electry

My first computer was a ZX81 bought by mail order something over ten years ago. Alas, it was electrocuted when I got a new TV which turned out to have a live aerial socket.

My present machine is a CPC6128. It died just before Christmas, and I assumed it, too, had been electrocuted as my refrigerator and four lamp bulbs failed at the same time. But the Electricity Board assured me that there had been no voltage surges.

My favourite dealers (The Computer Shop of Poole) came rapidly to the rescue and supplied me with a replacement monitor in part exchange.

By the way – I am 73 (and a bit).

John South, Creekmoor, Poole

Well there we have it. 73-and-a-bit doesn't beat Mr Wilkinson who leapt into his 74th year last week. Are there any 75-year-old readers computing away out there?

H F-W

MAIL SHORTS

■ Missed out

As I was reading *Express* 115 I noticed the front cover (Well done! – H F-W). 'So that was Christmas... but now the dust has settled *Express* can reveal' it said.

I ripped open the magazine, dying to know how the SAM Coupé got on through Christmas. I searched, and I searched, and I searched...

I noticed that you had mentioned every computer under the sun – except for the SAM Coupé!

Paul Strang, Lancashire

Well, the man who wrote the piece tells me that the SAM was left out because it is not a mainstream home computer. Yes, I know, all you SAM owners will moan and groan – but it's not in the major High Street multiples, and the feature was looking at their sales.

H F-W

■ Beard bother

Simon Butcher forgot to mention Alan Sugar in his list of computer people with beards and glasses. OK, so his beard isn't quite ZZ Top style, and he doesn't appear to wear glasses – but he may wear reading spectacles.

Maybe Mr Sugar would care to write in and tell us whether he wears any visual aids?

Daniel Walker, Reigate, Surrey

Then again, maybe he wouldn't. I wouldn't put money on a letter from Mr Sugar – but I could be surprised. Over to you Alan...

H F-W

■ Half shell, half-baked

Out of curiosity, would a pirated version of the Turtles game be Mock Turtle?

Ron Bullock, Deepcar, Sheffield

Probably not. But would a World Student games featuring three students be a complete cock-up? (Tenuous Sheffield-related joke there, readers.)

H F-W

■ Fiscal Wizard

I have just looked in my Empire Stores catalogue and found that I can buy games cartridge for Sega, Atari and Nintendo consoles for as little as 80 pence a week. If I could buy Amiga software this way, I'd buy a damn sight more than I do at the moment.

D Preston, Tunstall, Staffordshire

Have you ever worked out how much you pay in total via your catalogue?

H F-W

■ TV Graphics

Just to add to this 'I've seen the Amiga on TV' thingy, is it true that they use the Amiga on ITV's *Catchphrase* to do the animations? The graphics look like they've been done on *Deluxe Paint III*. Can anyone confirm this?

Steven Lord, Hebden Bridge



Yup, you're right. According to Chris Allen of a TV graphics company called Fingers, the A500 and A1000 were in fact used for the graphics in the current series – eight computers in all were harnessed to the task, with the A500s being slaved to the A1000s and Syquest drives used to store the graphics data.

The Amiga usurped some American Mindset PCs which were used in the earlier series – Amiga genlock boards made life much easier for the production team, but regular Amiga crashes made life more complicated.

We might bring you the full story in due course, dear readers... meanwhile, here's a fiver for your trouble Steve.

H F-W

• Up for the century: *Catchphrase* host Roy Walker will be fronting the 100th episode of the show on 10th February – aided and abetted by Amiga graphics.



DISKS DISKS DISKS DISKS DISKS

3¹/₂"NEW LOW PRICES 3¹/₂" DS/DD DISKS

THESE DISKS ARE ALL:

- ★ 100% Certified error free
- ★ PIN NUMBERED
- ★ INDIVIDUALLY WRAPPED
- ★ MADE IN W. GERMANY
- ★ COME COMPLETE WITH LABELS

From
33p
each

ds/dd SPECIAL OFFER ONLY WHILE STOCKS LAST

QUANTITY	10	25	50	100
	.38p	.37p	.35p	.33p

PRICES ARE PER DISK - CALL FOR PRICES FOR LARGER QUANTITIES

3¹/₂"

ds/HD .87p per disk

5¹/₄"

QUANTITY	10	25	50	100
ds/dd	.26p	.25p	.24p	.23p
ds/HD	.45p	.44p	.43p	.42p

5¹/₄" DISKS ARE SUPPLIED WITH WRITE PROTECT TABS, LABELS & ENVELOPES

EXTRA LABELS - 5¹/₄" and 3¹/₂" Labels
100 labels £1.50 per pack 1000 labels £8.50 per pack

LOCKABLE STORAGE BOXES

3 ¹ / ₂ " 40 Capacity.....	£4.50 each
3 ¹ / ₂ " 50 Capacity.....	£4.95 each
3 ¹ / ₂ " 100 Capacity.....	£6.25 each
5 ¹ / ₄ " 50 Capacity.....	£4.50 each
5 ¹ / ₄ " 100 Capacity.....	£5.75 each
Amiga and Atari keyboard Dust Covers	£3.00 each
Mouse Mats.....	£2.00
Mouse House.....	£2.40



To:
Media VALUE
 Northumberland House,
 Dept NCE 31/01,
 Drake Ave, Staines,
 Middlesex TW18 2AP

☎ (0784) 466744
 FAX. (0784) 450845
 CREDIT CARD
 HOTLINE (24 hours)
 (0784) 451011

I enclose a cheque/P.O for

Credit Card No.....

Expiry Date.....

Signature.....

Quantity	Description	Total
VAT included Postage and Packing £2.75		Postage
Next Day £10.00 (UK) only		TOTAL

Name.....

Address.....

Postcode.....Telephone.....

NCE/02

LIBRARY CASES

3 ¹ / ₂ " 10 Capacity.....	£1.05 each
5 ¹ / ₄ " 10 Capacity.....	£1.05 each

BANX BOXES

Lockable, stackable, great space saver for
 horizontal or vertical stacking holds approx

70 disks.....	£9.00 each
2 OR MORE BOXES	£8.00 each
Cleaning Kits	
3 ¹ / ₂ " & 5 ¹ / ₄ " Disk & Fluid.....	£2.00

**WE OFFER A NO QUIBBLE
 REPLACEMENT OR MONEY
 BACK GUARANTEE**

**PRICES ARE SUBJECT
 TO CHANGE
 WITHOUT NOTICE.
 ALL PRICES INCLUDE VAT.
 EDUCATION AND GOVERNMENT
 ORDERS WELCOME.**

**CREDIT CARD HOTLINE
 (24 hours)**

0784 451011



HIGH QUALITY DISKETTES

PIN NUMBERED QUALITY DISKETTES 100% CERTIFIED AND
GUARANTEED 100% ERROR FREE. MANUFACTURED AND
QUALITY ASSURED BY AN INTERNATIONAL BRAND NAME

3 1/2 DS COLOURED
2 DD

39p EACH

RED, WHITE, BLACK, YELLOW, ORANGE, GREEN.

ORDERS
OVER 100
RING FOR PRICE

3 1/2 DS DD 35p
EACH

3 1/2 DS HD 75p

5 1/4 DS DD 22p

5 1/4 DS COLOURED DD 28p

5 1/4 DS HD 42p

3 1/2 PLASTIC LIBRARY 5 1/4 CASES EA **89p** STORAGE BOXES
3 1/2 40 cap...£4.20 3 1/2 80 cap.. £4.60
5 1/4 50 cap...£4.40 5 1/4 100 cap £4.90

EURODATA
12A QUAKERS YARD
ADAM AND EVE ST
MARKET
HARBOROUGH
LEIC LE16 7LT
TEL: 0858 433992
FAX: 0858 432549

LIFETIME GUARANTEE
**ALL PRICES INCLUDE DISKETTE
LABELS ENVELOPES AND VAT**
ORDER NOW WITH POSTAL ORDER OR
CHEQUE MADE PAYABLE TO EURODATA,
OR TELEPHONE YOUR ORDER USING
MASTERCARD & VISA. SUBJECT TO
AVAILABILITY
ADD £3.20 P&P

RING FOR
MEMOREX
BRANDED PRICES



LOWEST
PRICES
FOR HIGHEST
QUALITY

COMPUTER REPAIRS

G B SYSTEMS — LINK The Repair Specialists

Sinclair 16K, 48K, 128K, +1, +2, +3
Commodore VIC20, 16, 64, 128, Amiga
Amstrad 464, 664, 6128, 8256, 8512, 9512
Acorn Electron, BBC, Master, Archimedes
Atari 400, 800, ST520, ST1040

All the above are on a fixed labour charge plus the cost
of the parts

IBM PC, XT, AT, PS2
Amstrad 1512, 1640, 2086, 2286, 2386
IBM Clones Any make / model undertaken

The above are charged on a hourly rate

Most printers and monitors repaired

Spares we can supply most parts from single ICs to
complete exchange boards

Sales(new/secondhand)-Installation-Cabling

Why not save hassle and send us your computer for repair by post

Phone 081 979 5638

86 Walton Road East Molesey Surrey KT8 ODL

150 Space public car park at rear of shop

Macintosh

RECOMMENDED PD

Quite a lot of the software which I've mentioned over the last few weeks has been shareware, so it's probably a good idea if we give some details of where you can get hold of the stuff.

Incidentally, to avoid upsetting anyone, I ought to say that it becomes cumbersome to refer all the time to 'public domain and shareware software', and that therefore sometimes in this piece I'll use the term 'PD' to refer to both public domain and shareware programs. Yes, I know that there's a difference. But I'm too lazy to type the whole thing in every time. So there.

The largest supplier of PD and shareware for the Macintosh in the UK is something called Translulum International. It is the sole UK and European distributor of the software in the Educorp collection which, in turn, is one of the largest collections in the USA – from where about 95 per cent of shareware comes.

Its fees for disks are reasonable: £7 for one disk, £6 per disk if you order two or more plus postage and VAT. Now, this is where it gets complicated: Translulum also has its own software library, in addition to the Educorp collection. For a £15 membership fee, you get access to the Translulum library, a catalogue on disk, two free disks – one full of fonts, one of Desk Accessories (DAs) – and a £2 voucher. Your membership lasts until you have received twelve issues of the Translulum newsletter, which could be two or three years, as it's fairly erratic.

Are you following this so far? Keep going...

If you're a member of the Translulum club, disk prices drop to £6

for one disk and £5 per disk when ordering more than one (again, plus postage and VAT).

Assuming your brain has been able to cope with the details so far, the best thing to do is order the Educorp catalogue, a 300-plus page book detailing all the programs available. To do this just send a cheque for £2.50 to: Translulum International Software Club, Saithaelwyd Ucha, Carmel, Holywell, Clwyd CH8 8NU. If you don't feel up to writing that lot on an envelope, its phone number is 0352 710276, or if you're rich enough you can fax Translulum is on 0352 714769.

The catalogue is certainly worth buying, and if you're likely to be ordering much software, membership of the club makes sense. Disks are dispatched promptly, and since the club phone number is the owner's home number, there is service even after normal office hours (although I would suggest you don't try it after about 7pm...).

Next up is the Macintosh User Group UK. I've mentioned these boys before; the user group magazine is good, the telephone helpline is excellent and any Macintosh user should think seriously about joining.

Individual subs are £30 per year, and membership entitles you to access to the software library, from which disks cost £6 each. All members receive a catalogue, and updates are printed in the mag. You could, if you wanted, take out a 'PD subscription' for £55, which entitles you to a disk every month containing the latest PD and shareware releases, although it's a bit expensive unless you're fairly sure that you'll use most of what is sent to you.

POSTCARD FROM AMERICA

California has been enduring the worst drought of the century, but like ants running to a picnic, the rain is predicted to fall on the revelers' heads. Complaints will not be allowed, since we're all supposed to be praying for non-perspiration airborne water.

The frustrated sweat of Mac salespersons around the supply of new Macs was evident in *The Top Ten Things to Say When Your Customer Wants to Buy a Macintosh Classic*, faxed to the Berkeley Macintosh Users Group. Some of the gems included:

"Huh? You'll have to speak louder!"
"Say! Did you know the female gibbon gestates for 236 days?"

"A wise choice, but listen – I've got a great deal on a couple of uses Mac Pluses..."

"Let's see now. It appears that we're all out now, and there's a waiting list of 3,572 names. Funny, we had plenty of them in this morning."

Stress can do that to marketing types. Some people think Apple is in the driver's seat, especially with the recession. When a customer walks through the door, cash in hand, nobody wants to tell them to wait a month or two. That money may be feeding the cat by that time.

THE INTERFACE DEBATE

Think that the debate on computer user interfaces is over? Think again.

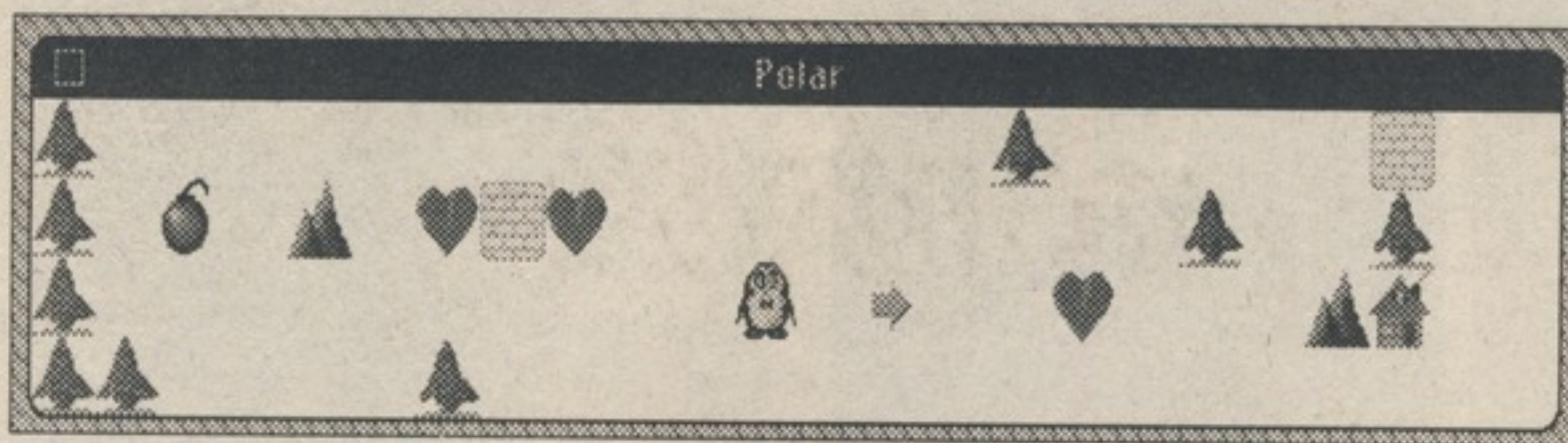
The way we interact with our technology is more than a matter of personal preference – it's an international political battle.

The dangers of standing too close to the microwave oven was evidenced by Randall Fields, chairman of Mrs Fields Inc. Mrs Fields is the cookie stand found in every US shopping mall. Randall gave the keynote address at the last Portable Computing Expo. He flamed the Macintosh, and all graphic user interfaces (GUI) for computers.

"The Macintosh must have been designed by the Soviet Union to limit American productivity," was one of his no-brainers. He said he couldn't "understand why Bill Gates would want to take our economy down the tubes by introducing Windows." He foamed at the mouth in his opposition to icons. I've often wondered if these rabid anti-GUIs have ever really used a Macintosh, other than a brief look-see in a computer shop.

A computer is a sorry substitute for human intelligence, but so are a lot of executives.

David Morgenstern



• Polar: the penguin's cute, and the game's tricky. How can you say no?

The Mac User Group UK also runs a bulletin board, and membership of the group gives you access to the PD and shareware available on the board. For a membership application form, call The Mac User Group UK on 0865 58027.

Another company which has a Macintosh PD and shareware section is Kingsway Computer Services. Its catalogue is only 24 pages long, and doesn't have a vast range of software, but on the other hand the disks only cost £4.99 each, including VAT and postage. And if you order ten disks at the same time, you get one free. Certainly, if the Kingsway collection has the stuff that you want, it's the cheapest option. Kingsway Computer Services is on 0742 750623.

Finally, a company called Shareware Marketing is apparently producing a Macintosh catalogue of PD and shareware disks. I know nothing else about it, except that it's free, and that the company claims to be "the

largest disk vendor in the world by revenue". Its number is 0297 24088 – remember to specify that you want a Macintosh catalogue, as otherwise you're likely to end up with a PC one.

DA DELIGHT

If you're bored with action games, try getting hold of a rather neat DA called Polar. Apparently it's a simple version of Pengo, although since I've never played Pengo I can't comment on that.

Essentially, you guide your penguin around, pushing about bombs, ice cubes and hearts in a frictionless environment, attempting to get the hearts into a house. It sounds easy, but I can assure you that it ain't.

I found it on CIX, in mac/files, although it may well be available elsewhere. It's certainly worth a download if you want a little light mental relaxation in between spreadsheets or whatever.

Ian Wrigley



SCHOOL CAN BE FUN!

Some long-awaited news this week from Database Software, up North. The company is just putting the finishing touches to *Fun School 3*, and the three packages that make up the three age groups look to be absolute corkers.

Fun School 2 broke all records in its time, proving the only educational package to storm the charts. *Fun School 3* is even better. I've just got my sweaty hands on the Under-5s pack, and I'll be putting it through its paces very soon.

WHERE ARE THE CARTRIDGES?

If Amstrad's sales of the GX4000 console and Plus machines were disappointing over Christmas, it might have something to do with software availability – or lack of it!

I've actually been phoning around a few dealers to find out what games are currently available. What I've discovered is that just because no fewer than twelve console games are featured on the special in-store demonstrators, it doesn't mean that you can actually buy them all.

The most clued-up dealer I managed to speak to had only six titles in stock. These were: *Batman – The Movie*, *Operation Thunderbolt*, *Barbarian II*, *Robocop 2*, *Crazy Cars II* and *Fire & Forget II*. I know that *Gremlin's Switchblade* is now reaching dealers, but that still only brings the total up to seven. What is going on?

Well, Amstrad did circulate a letter claiming that there would be twelve titles available on cartridge as long ago as last December, but there was the somewhat predictable rider that the

information was based on information supplied by the publishers.

And they are now as much in the dark as I am. Amstrad's cartridge duplicating is not yet, it seems, running as quickly as it's supposed to – to say the least. And many publishers are putting their console games on hold while they work out what the new machines are going to do. Certainly, if the punters don't see the software on sale, they're going to think twice about buying the machine. All this is leading to something of a catch-22 situation, I suspect. Watch this space...

ROBO IS BACK!

But there is happier news too. I've just got hold of a review copy of *Robocop 2* from Ocean. First impressions are of a tough game with some slightly iffy animation as old Robo leaps about. Those are only the first impressions, though – the game, once you get into it, is a lot, lot better than that. For a final verdict you'll have to wait until I've got stuck in a bit further.

FRESH FANZINE

"More wit than Kylie Minogue!" says a coverline, "More type-ins than we know what to do with!" screams another, "More features than a thing with lots of features!" wails a third. What is all this?

It's the cover of a new fanzine, in fact, by the name of AOK. The authors are Simon Tarplin, Matthew Harrodine and Paul Escott, although a box in the magazine explains that they are on the lookout for contributors.

AOK issue one has a review of the new Amstrads, a flight simulator round-up, a competition to win a camera, a

PHILIPS MONITORS

FACTORY REFURBISHED STOCK

Inexpensive solution for:-

- ★ Upgrade or additional monitors
- ★ Laptop external colour display
- ★ Service replacement for faulty units

Ex-demo and display units in good condition. Factory tested and repacked to specification.

WARRANTY - Six Months

14" VGA Colour	Philips 9CM 9809	(0.29)	£180
	Philips 3CM 082	(0.31)	£165
	Goldstar VC2/OEM	(0.31)	£165
	Taxan SV 780	(0.31)	£165
	Philips 3CM 9609	(0.39)	£150
14" EGA/Colour	Philips 9CM 073	(0.31)	£135
	Taxan SV765	(0.31)	£135
	Philips 9CM 053	(0.39)	£125
	Philips 9043	(0.42)	£120
14" CGA Colour	Philips 8CM 852	(0.39)	£115
	Philips 8852	(0.39)	£115
	Philips 8832	(0.42)	£110
	Philips med-res/8832	(0.42)	£95
	Philips 8801/2	(0.65)	£80
14" VGA Mono	Philips 7BM 749 (P/White)		£55

Suitable for
Acorn, Amiga
& Atari

Data cable terminations:-

VGA Colour - 15pin D shell (plug); EGA Colour - 9pin D shell (plug); CGA Colour- SCART & DIN sockets - Various cable types, optional extra
VGA Mono- 15pin D shell (plug).

CARRIAGE & INSURANCE:

for next (working) day delivery:

Colour - £12.50, Mono - £9.95

All prices quoted are subject to VAT

All items offered are subject to availability

Information sheet available on request
TELEPHONE ORDERS TAKEN USING



COMMONSIDE

Unit 13, 193 Garth Road,
Morden, Surrey. SM4 4LZ

Tel: 081-330 7533 Fax: 081-330 4838

LIMITED EDITION SPECIAL OFFER PLUS FREE MEMBERSHIP

- Exclusive limited edition of 500,000 books.
- A computer hardware information facts book.
- An attractive book with a distinctive colour cover.
- Access to over 150 pages of solid information.
- Essential information without the jargon.
- An excellent quick reference book.
- Fraction of the contents:- IBM PC & compatibles, 16 Bit hardware, hard disks, memory, useful commands, DIY assembly, leisure & business software, installations, CD-ROM, printers, useful hints, tips & much more.
- You will get value for your money in the first 5 pages.
- Limited edition so only available through computer related magazine - while stocks last. (RRP £14.95).
- Now the most amazing part is the price (**£3.95**) inc P&P.
- We even pay your postage (FREEPOST).

PLUS FREE MEMBERSHIP (Normally £11.95)

- FREE** - Booklet on how to start up in programming & make money using your computer.
- FREE** - Members card with personal identification number.
- FREE** - Stickers exclusive to Syncrosoft & other bits.

Retail shop & office:
9/10 Morland Gardens,
Southall, Middlesex, UB1 3DY
Tel: (081) 571 1852
Opening hours: 10am - 4.30 pm
HSG GROUP
ESTABLISHED 1984

* Please be patient with the delivery of your book and members pack, as staff will process your order as fast as possible.
 Thank you!

MAIL ORDER:-

Yes I would like to order _____ copy of Computer Information book plus free membership at limited edition price of

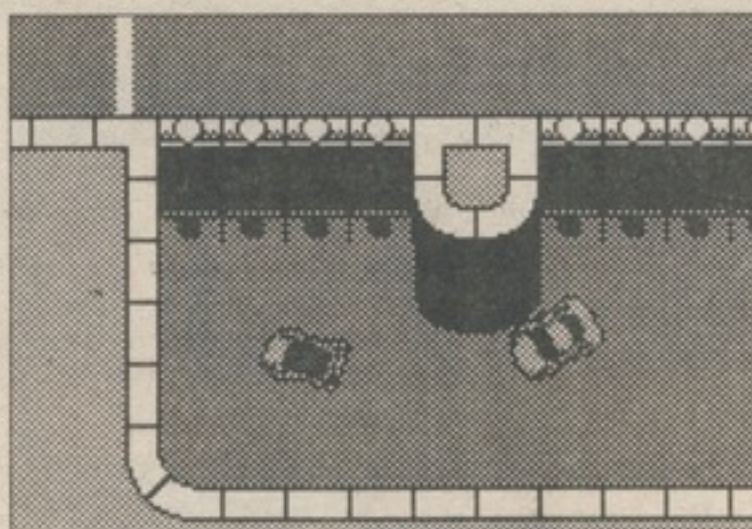
£3.95 (inc P&P).

Please print your name and address on a sheet of paper. Send & make cheque/P.O. to:



**FREEPOST SOUTHALL
MIDDLESEX UB1 3BR**

NO STAMP REQUIRED*



• Supercars: Tough racing at the hairpin. It's the first lap, and already you're second...

couple of game reviews and some type-ins. Just a couple of words of advice lads. DTP programs on the CPC can offer loads of typefaces, but there probably only about two or three that are actually readable at body text size, and they're the ones that printers do as standard. Also try to have every page using the same headline and body copy style - it gives the mag a much more unified look.

Other than that, the mag is bristling with enthusiasm and originality. If anyone is interested in becoming either a subscriber or a contributor, write to AOK at: 31 Colebrook Road, Shirley, Solihull, West Midlands B90 2LB.

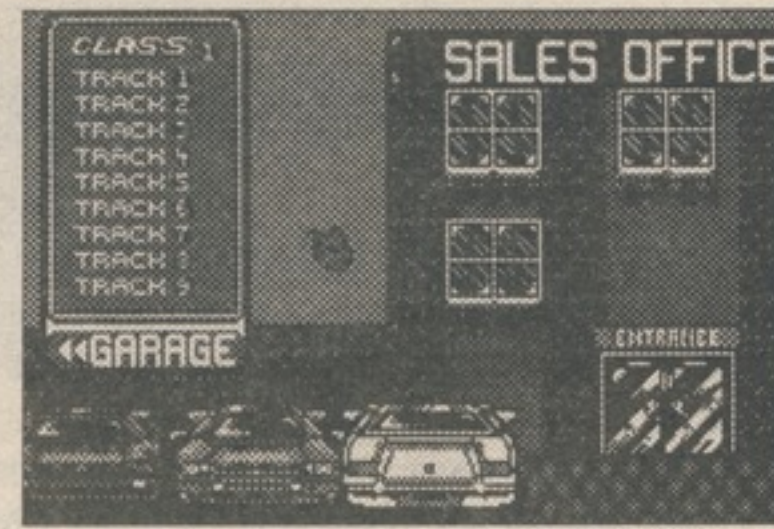
SUPERCARS

Gremlin Graphics has got a real head of steam up at the moment. First there was *Shadow of the Beast*, then *Switchblade* on the console, then the brilliant *Lotus Esprit Turbo Challenge* - and now there's *Supercars*.

It's another driving game sure enough, but a long way from *Lotus Challenge* in style. It's a viewed-from-above effort reminiscent of the classic *Super Sprint*, but instead of the whole track being visible at once, you only see a section at a time, the screen scrolling as you move around the circuit. This does mean bigger, better graphics, but you don't get a simultaneous two-player mode (it would have to be a split-screen display if you did).

You start off pretty easily, racing against three computer cars on a none too difficult track. You'd have to be pretty crap not to win, basically, and when you do you pick up a nice, fat, juicy cheque for £20,000. The significance of this becomes apparent between races, when you get the chance to visit either the garage or a new car showroom. In the garage you can buy goodies like a turbocharger, side armour (you'll find out why), missiles and more. You can also repair your bodywork, refuel, get some fresh rubber and fix your engine.

You're going to need all that because although the races start off easy enough, the more you compete in, the tougher they get. Not only do the



• What do you do - race, go to the garage or browse around the showroom?

computer cars get faster and more determined, the tracks start to develop puddles of oil, water and something which behaves suspiciously like glue...

Ultimately, the bog-standard motor you start off with is not going to have what it takes to compete in the later races, even with all the goodies you can bolt on in the garage. It's just as well, then, that you can trot off to the showroom when you've got enough cash and buy yourself a bigger, better, faster motor. There are half a dozen waiting in the showroom, but you're going to have to win quite a few races for each upgrade.

The graphics in *Supercars* are simple, but neat and very effective. The scrolling is pretty smooth, too. Sound consists of a soundtrack that plays all through the race, only drowned out by terminal tyre squeal as you pile into yet another corner at twice the speed you should, plus the ominous thumps as your already knackered bodywork smacks the walls again.

Supercars plays very well indeed. The control method is simple, and the cars behave convincingly on the track, sliding gracefully as you overcook the corners. One nice touch is that you can prompt massive oversteer if you let go of the Fire button (Fire is accelerate) half way through a corner.

There are nine tracks on which to race, and although the first few will seem easy, things get a lot tougher very soon after that. Once you've completed your season, you then move onto 'Class 2' racing which is tougher again. After that there's Class 3 and I haven't got more than two races into that one, despite many hours of practice. The subsequent classes can be accessed with passwords, so there's no need to return to the earlier levels once you've completed them.

Supercars won't win any prizes for originality or accuracy, but it is a very polished and playable version of a favourite old game style. It is also tough enough to keep you going for ages. If only there had been a two-player mode, though - those human versus computer races do get a bit dull eventually...

Rod Lawton



HARD HITTING KEYBOARD

I always thought synthesizers were the only kind of keyboards that were velocity sensitive, but Smartek in the States has proved me wrong.

It has just launched what it claims is the world's first velocity sensitive keyboard. We're not just talking first for the Amiga here, mind you. No siree, Smartek's product is an absolute first

on any computer. It's available for a number of machines including the Amiga, Mac, PC, ST and even the Sega Genesis (that's a Megadrive, to us UK computer users).

The keyboard comes complete with two utilities - one useful, one perhaps not so useful. The first is a patch program for the AmigaDOS keyboard driver which will allow the Amiga to auto-

matically interpret how heavily keys are struck. As an example application, Smartek claim that it can be set up for word processors so that when a key is pressed hard, the text style is changed. When you hit the key a bit lighter, the text changes back. The second application is apparently designed to help teach typewriting. Basically, the machine will tell you when you are hitting the keys too hard by going, "ouch".

1500 GOOD REASONS TO BUY

Commodore's latest baby has finally arrived and, thanks to a sympathetic bank manager and Andrew Ball at Commodore, I've finally got my hands on one. It should retail for around a grand and here's what it has to offer. **The machine** - Anyone who has ever owned an Amiga 2000 will instantly recognise the 1500. Apart from the rather tacky black and white badge on the front of the machine, the 1500 is basically a revision 6.2 B2000. If you don't believe me, just open up the machine and read the model number on the PCB!

OK, the 1500 isn't a new machine, but that isn't necessarily a bad thing. For starters, the 1500 is based on the very latest release of the 2000, so you actually get a machine that is fully-compatible with all 2000 plug in cards and peripherals (including the Video Toaster, Flicker Fixers, Processor accelerators et al). Not only that, but you'll also be able to upgrade the machine to Workbench 2.0 and the Enhanced Chip Set when they are made available to existing 2000 users.

The machine comes equipped with a single megabyte of RAM. Just like the latest release of the B2000, the 1500 includes the ECS Agnuschip, so that megabyte of RAM is completely accessible by the customchips.

Further RAM will be treated as fast RAM, but having 1Mb of onchip RAM still proves to be exceptionally useful if you're into DTP or Desktop Video (although A3000 users are spoilt with 2Mb of onchip RAM!).

Also bundled as standard is an extra 3.5inch floppy (which, surprisingly, Commodore do actually fit before shipping) and a high quality colour monitor. As if trying to keep up with Philips' new trendy looking monitor, Commodore have restyled the 1084S (yes, it is stereo!) once again.

Deluxe Paint 3 - Well, what more can I say about Electronic Arts' acclaimed paint and animation system other than the fact that there's simply nothing TO touch it. If Commodore decides to use DPaint 3 within future bundling deals, I can see the Amiga paint package market dying a very quick death (that is, until DPaint 4 is launched!).

For those of you who have been living on Mars for the past five years, DPaint is a powerful paint system that allows you to produce artwork using up to 64 colours simultaneously (using ExtraHalfBrite). Version 3 of DPaint now includes animation facilities, allowing you to breathe life into your artwork.

Platinum Works - If you need a decent word processor, a database or perhaps even a spreadsheet, then MicroSystems' acclaimed suite of productivity software will more than fit the bill. Noteworthy among the packages bundled is *Platinum Scribble*, an enhanced release of MicroSystems' well respected word processing system. *Scribble 2*. All the standard functions you'd expect from a topflight word processor are there, plus comprehensive spell checking and thesaurus facilities.

Also included are special versions of MicroSystems' other software including the *Analyze!* spreadsheet, *Organize!* database, *Online!* communications and a number of extra utilities (including aside-ways printing utility for *Analyze!*). *Platinum Works* certainly isn't either new of particular groundbreaking, but it should prove to be more than adequate for most people's requirements.

Populous - EA's award winning *Populous* gives you the chance to play God with the people of a small planet. When it was originally launched, the game received rave reviews from just about every games reviewer worth their salt. The idea of the game is to help your own people populate randomly generated islands by making the land fit for habitations. While this is taking place, your opponent (the Devil) is doing

likewise. Obviously such cohabitation can't last, so both yourself and your opponent can wreak divine vengeance on your each other's people by sending earthquakes and floods against them.

Their Finest Hour - Perhaps Commodore thought that a simulation of modern air warfare would provoke bad publicity, so it has plumped instead for US Gold's simulation of the battle of

Britain. Combining strategy and 3D combat action, *Their Finest Hour* is a pretty good game that is sure to keep you enthralled for hours.

Battlechess - A true Amiga classic. Even if you hate chess, you'll love *Battlechess*. Some would say that gameplay has taken second place to graphics and sound, but *Battlechess* is one of the few chess games that will appeal to all. Absolutely brilliant.

Sim City - If you think you have the solution to urban decay, then Infogrames' *Sim City* could well be your cup of tea. In this game, you can play the role of both mayor and town planner in this dynamic real-time simulation of city life. Build houses, factories and airports, organise urban transport, hire police, fireman, bulldoze entire neighbourhoods, collect taxes; these are just a few of the tasks that will be your responsibility.

In a special mode, you can even cause tornadoes, floods and fires at your whim. Even better, you can save San Francisco from the great earthquake of 1906, or even Tokyo from Godzilla. Both *Sim City* and *Populous* include expansion disks to further enhance two very good games. In the case of *Sim City*, there's even an editor which allows you to edit cities to your precise requirements.



• The Amiga 1500, well worth the asking price.

NEW LOW PRICES FROM BCS

INCL FREE LABELS

BULK BUYERS

50 3 1/2 DS/DD.....£20
100 3 1/2 DS/DD.....£33
150 3 1/2 DS/DD.....£47
200 3 1/2 DS/DD.....£60
400 3 1/2 DS/DD.....£115
500 3 1/2 DS/DD.....£135
1000£CALL

Price incl VAT & P&P

DS/DD

DISKS & BOXES

50 Disks + 80 Box£23
100 Disks + 80 Box£37
150 Disks + 80 Box£50
200 Disks + 80 Box£63
400 Disks + 80 Box£118
500 Disks + 4 80 Boxes.£148

Price inc VAT & P&P

3 1/2

5 1/4 DS/DD20p
5 1/4 DS/HD38p

SONY BULK 38p

3 1/2 High Density **60p**

KAO BRANDED 69p

3 1/2 40 Cap Box£4
3 1/2 80 Cap Box£4.30

3 1/2 150 Cap Posso Box **£15**

5 1/4 50 Cap Box£5
5 1/4 100 Cap Box£5.75

STAR LC-200 Colour Printer £199

STAR LC-24-200 Colour Printer £310

Philips CM8833 MKII Monitor £209

ADD £3.50 FOR 3 DAY DELIVERY (FROM DESPATCH) ADD £9 NEXT DAY

AMIGAS

Amiga 500.....£310
Screen Gems£355
+ Astra Games£385
Class of the 90's ..£510
First Steps.....£510
Dust Cover£5
1/2 Meg Upgrade.....£32

1/2 Meg + Clock£37

Cumana Drive£63
Mouse Mat£2.50
Zipstick.....£11
Jetfighter£12
Printer Lead.....£8

ATARIS

Lynx£118
Discovery£259
Turbo Pack£350
Cumana Drive£68
Dust Cover£5

Call or Send cheques/Postal Orders to
**BCS LTD, 349 Ditching Road,
Brighton E.Sussex BN1 6JJ**
Tel 0273 506269 or 0831 279084



COMPUTER REPAIRS

& , AMSTRAD, IBM, SINCLAIR

FIRST AID FOR TECHNOLOGY

- * Commodore Registered repair centre.
- * Amstrad/Sinclair Registered repair centre.
- * Over 20 engineers at your disposal.
- * Fast Turnaround, will typically be 24/48 hours.
- * Many repairs at fixed prices, including parts, labour & VAT.
- * Repairs warranted.
- * Trade prices available.
- * For a fast efficient service, with the peace of mind you would expect, simply hand deliver or post your machine to the workshop address detailed below and we will do the rest.
- * Please phone for further details

TELEPHONE: 0582 491949 (4 lines)

**WTS Electronics Ltd, Studio Master House,
Chaul End Lane, Luton, Beds. LU4 8EZ.**

WESTWOOD COMPUTER & SOFTWARE MART

Unit G5, Avonside Enterprise Park
Melksham, Wiltshire.
Telephone: (0225) 790119

SPECIAL OFFERS

Amstrad 464/mono	£145
Amstrad 464/col	£245
Amstrad 6128/col	£360
Spectrum +2	£95
Amstrad FD2 D/drive	£75
Amstrad 6128 colour monitor only	£110

We also carry stocks of PC

upgrade equipment such as hard/floppy drives, memory upgrades, motherboards serial/parallel cards, VGA cards etc.

Most makes of printer available, for example:

Star LC24-200£275

All prices include VAT - Carriage extra

VISA



100 3.5"
DISKS WITH 100 CAP
STORAGE BOX
£34.95



100 5.25"
DISKS WITH 100 CAP
STORAGE BOX
£34.95

Fantastic Savings!

All boxes come complete with dividers, two keys and are antistatic

All discs come with labels and are guaranteed 100% error free

HUNMANBY COMPUTER SUPPLIES SUPPLIES HOUSE

HUNMANBY INDUSTRIAL ESTATE
FILEY, NORTH YORKSHIRE
YO14 0PH

Tel: 0723-891-888
(24 hours) 5 Lines
Fax: 0723-890-836

Same
Day
Despatch

Free
Delivery

ASK FOR FREE
CATALOGUE

Remember - all prices include VAT and delivery! There are no hidden extras to pay! Personal callers welcome:
Monday-Friday 9.30am - 4.30pm



E/OE

Trade Accounts Welcome
All prices include VAT
Education Orders Welcome

VISA

DISPLAY ENHANCER LAUNCHED

Users jealous of the quality of the A3000's display will be pleased to learn that Commodore has finally made the A3000's Display Enhancer hardware available to both 1500 and 2000 users as a plug in card. What's more, this official flicker killer card beats all competitors in the price department at just £99. For applications such as DTP and CAD that require a high resolution display, the card promises to deliver a rock steady image when used in conjunction with a multi-sync monitor. Contact Commodore on 0628 770088.

A-MAX 2 UPDATE

Still waiting for the launch of A-Max 2 Plus, the plug-in card version of

ReadySoft's acclaimed Macintosh emulator? If so, then the news isn't good. According to UK distributor, Entertainments International, ReadySoft still hasn't finished the card. Indeed, the American company seems to be keeping rather secretive about the whole affair.

When I recently phoned EI for some information on this product, I was surprised to learn that not even it had received any form of information. Not a single picture, press release or even a bit of text describing specification-type details. Despite this lack of information, EI maintains that the card should be available in March. Personally, I'll only believe it when I see it!

Jason Holborn

Archimedes**SYSTEM ANTICS**

Applications often come with a system folder on the disk. This should contain the relocatable modules needed for the application to run; the shared C library, floating point emulator and ColourTrans module are pretty well universal now.

From time to time, there are new versions of these and other modules, and it's a nightmare trying to keep all your floppy disk's system folders up-to-date. If you don't update them all, you risk a crash when an old module in memory is replaced by a new version as you start a new, more recent application.

The answer is simple: keep just one floppy (plus a backup) with a System folder, and put all your new modules in that. It may mean a couple of disk swaps when you fire up a new application, but that's less trouble than updating all your disks every time there's a C library upgrade.

How do you keep your system up-to-date? Check the dates of any new modules you receive (use the desktop and display Full Info in the filer windows), and the version numbers (load the module by double-clicking on it, then type f-12 and *Help Modules).

SysMerge is an Acorn utility for keeping your system folder up to date without all this messing about. It comes free if you get the new printer drivers from your dealer or from SID (Acorn's own bulletin board), but not if you get them by buying Clares' Schema. You run SysMerge, and drag your old system folder plus another system folder - which may contain newer versions of some modules - on to it. Only the new modules are transferred to your old System.

A quick techie tip: make sure that in the Boot and Run files within your System folder, Wimp\$Scrap is set to <Obey\$Dir>.ScrapFile and not System:ScrapFile. Some programs (Schema for example) can't transfer data to other applications if Wimp\$Scrap is set incorrectly. Load the Boot and Run files into Edit to check.

A BETTER FILESERVER?

While the 'stars' of the recent BETT show were undoubtedly Longman Logotron's Revelation (discussed last week) and Digital Services' Squirrel

(below), there were a number of other new products that caught my eye.

Third on my list was the latest Acorn Level 4 Eonnet fileserver software. This keeps files on an Archimedes, and distributes them around a network of Archimedes, Masters and model Bs. It runs as a RISCOS task, but is still a bit faster than the existing FileStore (a dedicated hardware fileserver). You can add almost any size of hard disk you want, and publish resources like Next Technology's CD-ROM around the network too.

Mostly it's better than FileStore because of the management tools - it makes network management a lot simpler. Harassed school network managers should check this out.

But beware, one of the major new features aimed at the classroom, the 'broadcast loader' that allows two or more machines on the net to load the same files at once, isn't quite ready yet and will only work with Archimedes, not old Beebs. Also, when asked about tape backup units, the Acorn person said, and I quote, "Err..." Full points to the man in the smart suit for pointing out I may need only a couple of gross of floppy disks to back up my fileserver.

For existing, mostly 8-bit networks, the SJ Research fileserver are probably still better. But Level 4 does make it simpler and cheaper to set up 'workgroup' nets of just a few Arcs, and is a great way to share a big hard disk and a PostScript printer between, say, five people.

GOING NUTS OVER DATABASES

Next please. I must be losing my grip. I didn't take any notice of the ads for the new Squirrel database from Digital Services. Yet if I'd only noticed the letters S, Q and L...

What drew me in was, in fact, a natty demo: two Arcs, one monitor, no people. One Arc was running Squirrel for real, the other was feeding it pre-recorded mouse movements to control it, as well as doing the spiel - the commentary to the whole demo routine had been sampled!

A more in-depth look at Squirrel showed it to be a rather groovy database manager. It's not 'relational' (for the techies, it's a flat file manager),

but it is easy to use. Setting up a new database is a matter of drawing the fields into a window with the mouse. Fields can be plain text, numbers, dates, drawings, sprites or *Maestro* music files, and you can make it look pretty by setting colours, typefaces, size and so on for each field. You don't have to specify which fields will be 'key' fields (as for example with *Minerva's FlexiFile*) because all the fields are automatically indexed.

Searching for items in the database is simple; you just drag the fields you want to check onto a search card, type in the data you want to match, and click. You can match just one field (like search for all your *Pickettywitch* LPs), or combine criteria together with And and Or (search for all the films with both Doris Day and Cary Grant in them). *Squirrel* can present the Ands and Ors in a neat graphic that makes it easy to check you're going to get what you expect out of a search. This, I like a lot.

It works on a network, and is 'multi-user' with record-level locking so several people can be using the database at the same time, I'm told (I haven't had a chance to try this bit yet, but I expect a small parcel in the post any day now).

The eponymic SQL is a 'structured query language', very much flavour of the month in database circles, but too complex for normal people to use. It's strictly 'wireheads only'. Now *Squirrel* can translate your easy search commands into real SQL commands, which can be sent off to another database to do the actual searching. In principle, anyway. If this works as it should, then *Squirrel* could be an epoch-making product for complex networked databases. Even if it doesn't, it looks like a great database manager for the rest of us.

At a shaving under £150, it costs the same as its obvious rival *FlexiFile*, but seems to be much easier to use. You trade the semi-relational aspect of *FlexiFile* whereby you can link items in two separate databases, for a better, more graphical approach to searching and a more attractive on-screen presentation. You can do a lot of the standard database and pretty presentational stuff with a package like *Genesis II* too, but the multi-user bit and graphical view of search criteria in *Squirrel* are worth their weight in something or other.

RISCBASIC UPGRADE

If you use Silicon Vision's RISCBASIC compiler, upgrade now to the latest 2.06 version which has an improved compiler. It's RISCOS compliant, so you can compile files by dragging Basic program icons onto the compiler.

Silicon Vision is also offering a Desktop Development Environment (DDE) which allows you to compile files by dragging them onto the compiler icon on the desktop from *Edit*, *Twin* or the *BASIC Editor*, and passes files back to these applications with syntax errors already marked. If you've registered an earlier copy, the DDE upgrade is £50. New copies of RISCBASIC 2.06 include both the compiler and DDE for £150.

LET YOUR FINGERS DO THE WALKING

If you want any further details forced upon you, here are the numbers to call. Remember to say Ken sent you. Digital Services: 0705 210600. *Minerva*: 0392 437756. SJ Research: 0223 461426. Silicon Vision: 081 422 2274. Acorn: 0223 245200. SID: 0223 243642 (use Prestel standards). You can get SID via Micronet too (*SID#).

Ken Coumarin



NOT A LOT OF PEOPLE KNOW THAT

When the old 8086 chips (or indeed, any of the other Intel 80x86 chips) wake up in the morning the first thing they do is look for an instruction. Keen little horrors aren't they?

You might think that a good place to look for your first instruction would be at address zero, but not Intel. It decided that a much better place to look for one is at address FFFF0H, or just 16 bytes short of a megabyte – so that's where the 8086 and all similar chips do look.

This is the reason why your PC's BIOS is right up there at the top of memory, hanging in space as it were. Clearly, since the chip is always going to look there that's a good place to put the instructions that start your PC doing something useful. It follows that forcing the chip to stop doing whatever it's currently doing and go there Right Now will reset the machine. Most reboot utilities do exactly that.

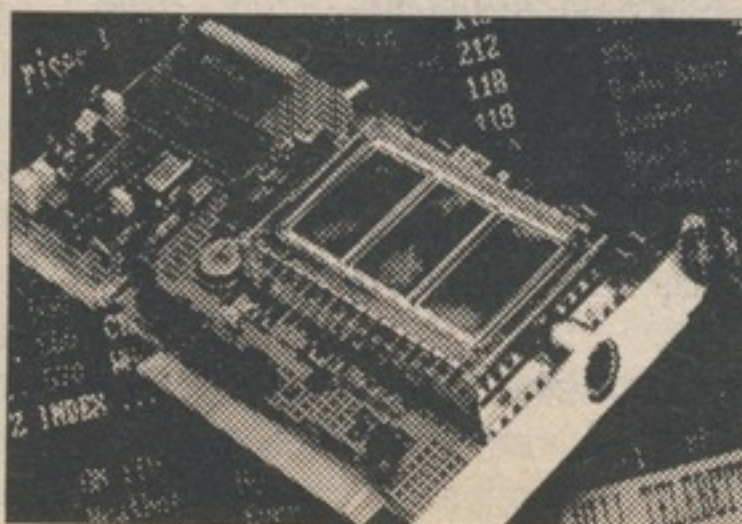
Of course, that's a cold boot, and it results in the PC going off and checking memory, looking for ports and all the other things that take time. Ctrl-Alt-Del by contrast, performs a warm boot. It

assumes that your machine has already been checked once and it's OK, so it simply re-initialises the PC and puts you back at the prompt – a much faster process.

You can do a warm boot by jumping to a specific memory location but it's much better to use Interrupt 19H, provided for that very purpose.

SHARE AND SHARE ALIKE

One of the major sales points of Microtext's teletext adapter has always been the ability to quickly refer to information on Ceefax and Oracle. Unfortunately the difficulty has been getting the computer to make use of that information directly. Microtext



• Microtext's teletext adapter.

BLITZ AMIGA! BACKUP SYSTEM

THE BACKUP DEVICE THAT AMAZED
THE WORLD OF ST USERS IS NOW
AVAILABLE FOR YOUR AMIGA!

BLITZ is Powerful!

- * Custom-designed backup circuit.
- * Backs up many Amiga Disks.
- * Bypasses Amiga Disk Controller.
- * Backs up from internal to external drive.

BLITZ is Fast!

- * High speed backup software.
- * Copies disks in as little as 40 seconds.
- * Reads and writes in a single pass.

BLITZ is Versatile!

- * Copies to up to three drives at once.
- * Backs up other format disks (Atari, PC).
- * Works on both A500 and A2000!

BLITZ is available *only* from

POWER COMPUTING
DESIGNERS OF BLITZ ATARI

Blitz Amiga£25
Blitz + PC880 Power Drive£85
Blitz + Power Dual 3.5" Drive..£130

Blitz Amiga and Power Drives may
be ordered by postal mail order or
by telephone.

POWER COMPUTING LTD

44a Stanley Street, Bedford, MK41 7RW

0234 273000

(5 lines)

We accept Access and Visa

Please make cheques & POs payable to Power Computing Ltd

Prices include VAT and delivery.

We accept credit card orders by fax on 0234 270133.

We reserve the right to change prices and product lines without notice.

Blitz is sold on the understanding that it is not used to
contravene the 1988 Copyright Act.

SEGA

UK MEGADRIIVE

Megadrive + Altered Beast	£179.99
Power Base Converter	£29.99
Arcade Power Stick	£34.99
Control Pad	£14.99
TAG 50 Joystick	£17.99
Alex Kid In Enchanted Castle	£29.99
Arnold Palmer Tour, Golf	£34.99
Budokan	£39.99
Columns	£34.99
Cyberball	£34.99
Eswat	£34.99
Forgotten Worlds	£34.99
Gain Ground	£34.99
Ghostbusters	£34.99
Ghouls 'n' Ghosts	£42.99
Golden Axe	£34.99
Herzog Zwei	£34.99
John Maddens American F.Ball	£39.99
Last Battle	£34.99
Mystic Defender	£34.99
Phantasy Star II	£59.99
Populous	£39.99
Rambo III	£29.99
Revenge of Shinobi	£34.99
Space Harrier II	£34.99
Super Hang On	£34.99
Super Monaco Grand Prix	£34.99
Super Thunderblade	£34.99
World Cup Italia 90	£29.99
Technocop	£39.99
Zoom	£26.99

MASTER SYSTEM

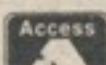
Aerial Assault	£29.99
Alex Kidd in Shinobi World	£29.99
Altered Beast	£29.99
Battle Outrun	£29.99
California Games	£29.99
Chase HQ	£29.99
Columns	£24.99
Eswat	£29.99
Gain Ground	£29.99
Gauntlet	£29.99
Ghostbusters	£29.99
Golden Axe	£29.99
Golf Mania	£32.99
Great Football	£24.99
Impossible Mission	£29.99
Indiana Jones	£29.99
Jungle Fighter	£29.99
Paperboy	£29.99
Parlour Games	£17.99
Pro Wrestling	£22.99
Operation Wolf	£29.99
Shinobi	£29.99
Submarine Attack	£29.99
Super Monaco G. Prix	£29.99
Thunderblade	£29.99
Ultima 4	£39.99
Wonderboy	£24.99
Wonderboy in Monster Land	£29.99
Wonderboy III	£29.99
World Cup Italia 90	£24.99
Y.S.	£32.99

* Soon

Compute-iT

151 HIGH STREET
TEWKESBURY, GLOS
TEL (0684) 290097
OPEN MON-SAT 9-5.30

All items subject to availability.
Prices subject to change.
PRICES INCLUDE VAT. ALL ORDERS
OVER £20 POST FREE. (under please
add £1). Payment by cheque or



CALLERS WELCOME UK MEGADRIIVE ENQUIRIES ONLY

supplies the relevant device drivers with the adaptor so that programmers, even BASIC programmers, can get at the info, but that leaves the rest of us a bit out in the cold.

ST owners have long had applications software which supports the adaptor directly for functions such as analysing a share portfolio, and now PC owners have some of the same facilities.

A free program has been written by Microtext which lets you download all the share prices you are interested in to a text file by typing a single command. This isn't anywhere near as sophisticated as the Atari program, but it's a start, and it's free. Also I'd much rather deal with importing a text file into a spreadsheet than writing code for device drivers.

To operate the software you write two lists, one of channels and teletext page numbers, the other of names of major companies. The program refers to the two lists and then checks Ceefax. The share prices are then output to a file, either labelled for direct reading or as a list of numbers for incorporating into a spreadsheet.

The program is available direct from Microtext on 0705 595694.

WORDSTAR FOR WINDOWS

Bowing to the inevitable, there is to be a version of WordStar for Windows. I must confess I find this a strange idea, as the main thing which sets WordStar apart from its rivals was its user interface. I still find myself hitting Control-K X on my Mac! Of course under Windows WordStar will have exactly the same interface and command key sequence as every other Windows program.

The other oddity about the new WordStar is given away by its name: WordStar Legacy. Yes, that's Legacy as in the Windows word processor. It appears that WordStar has bought

Legacy from NMI, and will be incorporating the source code into its product. Whether that means it will just be selling Legacy in a new box is not clear.

The PR company did send a nice little graph indicating where it thinks WordStar Legacy would fit in to the word processing market, but after staring at it for half an hour I was none the wiser.

WordStar Legacy will be available from March 1, with no price yet announced. More on 081-6433 8866.

LASERJET SOLUTION

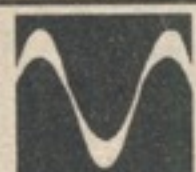
When you run a program under Windows, all the printing goes through the printer driver which is part of Windows. The LaserJet printer driver is not held in very high esteem; it's slow and a bit cranky in operation. Hence SuperPrint.

SuperPrint is a new improved whizzy LaserJet printer driver which offers PostScript-like features such as scalable printer fonts on the fly and alterable line screens for graphics. The product also claims that it prints text and graphics faster than the Microsoft driver. The examples which Zenographics sent me certainly are of a higher quality than the equivalent ones printed with the ordinary driver. And another major plus is that SuperPrint provides on-the-fly screen fonts as well, banishing the jaggies.

SuperPrint has a competitor in Adobe Type Manager, but the two programs operate in a totally different way; SuperPrint offers finer control, whereas ATM is much easier to use. Whichever you prefer SuperPrint is worth investigating if you have a LaserJet and run Windows.

For more details contact SuperPrint's UK distributor Bit UK on 0420 83811.

Stuart Anderton and Steve Patient



DATAPLEX COMPUTERS LTD.

129 Bath Road,
Slough,
Berkshire,
SL1 3UW

19 High Street
Swindon,
Wiltshire

Tel: 0753 35557 Tel: 0793 488448

SHOWROOM

open:
Mon - Fri
9.30 - 5.30
Saturday
9.30 - 4.30

MAILORDER

Consumables
£1.50
Hardware
£8.00
Prices
excluding VAT

**AMIGA A500
HARDWARE**

Amiga A500 Screen Gems Packs + free disks	£305
Amiga A500 Screen Gems Pack + free disks + 10 extra games pack	£345
Amiga A500 1 Meg Class of 90's	£459
Amiga A500 1 Meg Class of 90's (First Steps)	£459

SPECIAL OFFER

Amiga A500 Screen Gems + 1 free box
disks + 512K RAM (1 Meg)

While stocks last

Amiga A500 + TV Mod + Mouse +
system disk + manuals

or

As above + 10 extra games pack

ATARI COMPUTERS

Atari 520STFM discovery pack includes 4 games	£240
Atari 520 STE Turbo Pack includes basic STOS and 7 games + Joystick	£310
Atari 1040 STE extra pack includes ST Words, ST Calc, ST Basic, ST Graphics, Hyper-Paint, STOS, 1st Basic, Print Game	£399

AMIGA/ATARI DRIVES

1 Meg 3.5" internal	£49
1 Meg 3.5" external	£60
1 Meg 5.25" external	£90

ACCESSORIES

512K Ram + clock	£39
Joystick	£10
10 Blank disks in library box	£8
Mouse Mat	£3
Amiga/Atari Mouse	£29

MONITORS

Philips CM8833 MK II Colour Monitor + FREE Lead	£189
SM 1224 (Atari)	£205
SM 124 (Atari)	£99

PRINTERS

Star LC10 Mono	£129
Star LC200 Colour (9 pin)	£180
Star LC24 200 (24 pin)	£210
Star LC24 200 Colour	£245
Star LC24/10	£175
Panasonic KXP1124+ lead	£199
Panasonic KXP 1123	£180
Panasonic KXP1624	£329
Citizen 120D +	£120
Citizen Swift 24 + Colour Upgrade	£259
Citizen Swift 9 + Colour Upgrade	£185
Epson LX400	£126
Epson LQ400 (24 pin)	£199
Epson LQ 550	£260

**LASER/INKJET
PRINTERS**

PLEASE CALL FOR PRICES

64

BOARD UPDATE

You're going to have to wait another week for details of how Heroquest is shaping up on the 64 (see Express 117) but the news just in is that US Gold is planning a special AD&D day to launch the next titles from SSI (which will include the sequel to the excellent *Champions of Krynn*). I'll bring you more details of the games when the dice rolling day comes.

At the other end of the entertainment spectrum is *Creatures 2* (see Express 116). All I know about this so far is that the deranged torture screens that put the icing on the proverbial cake the first time around will feature more heavily in the sequel, though when I spoke to the people at Thalamus they said they didn't want to lose the balance of the original's gameplay. Good for them.

BACKTRACKING

This is the beginning of the quietest time for games releases. Christmas costs software houses almost as much as they make. They can't keep it up

forever. Nor can we, for it works both ways.

A few years ago, on another magazine, February was noted as being the month in which most reader submissions came in. The conclusion was that people were spending more time with the games they had and less time devouring new ones. And this kind of consolidation isn't restricted to games players. *Commodore Format's* technical editor is almost snowed under with readers' programs at the moment.

It's the ideal time to launch the kind of programs so inaccurately described as productivity software. Incentive is just about to do this with the *3D Construction Kit* (Express passim). It sounds like the kind of program that would have been lapped up by both PD fans and entrepreneurs alike five years ago. In fact, five years ago, Incentive brought out a similar productivity tool called GAC (*Graphic Adventure Creator*) on the 64 which did just that. People used it successfully as a high level adventure-writing language and some of the results that filtered through the PD

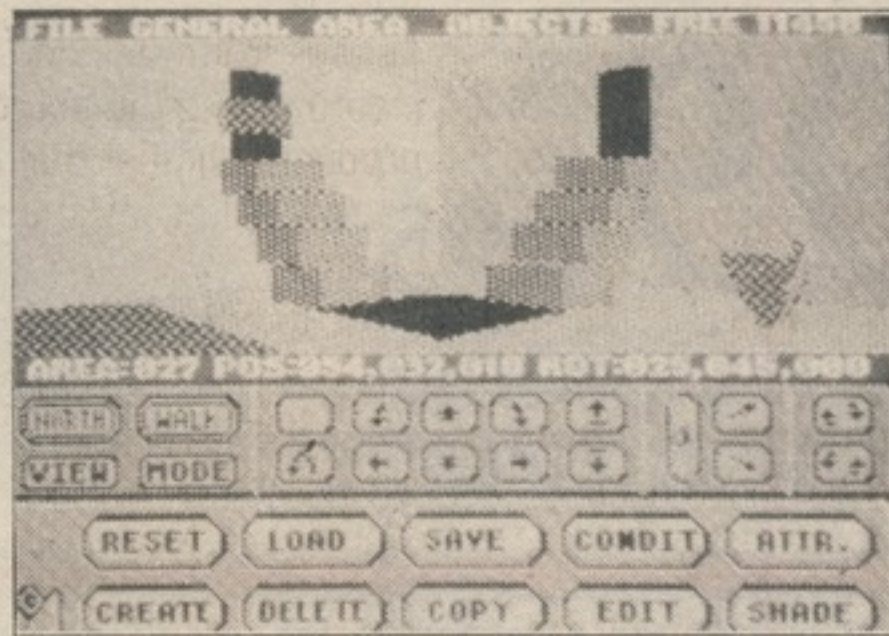
chain were very promising. Even though nobody ever released a game that really used GAC to its full potential, it created at least one small company (now sadly no longer with us).

It would be good to see the same thing

happening with 3DCK if it can really handle large (adventuring size) scale models with built in triggers. Public domain demos might never contain a scrolling message again. Fat chance.

Despite the potential of the kit to kick people's imaginations up the backside there seems to be less motivation among 64 users now than back in 1985/6, even though there are at least as many active users of the machine now as there were then. Part of the reason why a flood of exciting kit-based demos isn't on the agenda is that five years ago innovative programmers were finding out for the first time what a lot of the current crop of programmers take for granted - how to get a glitch-free scroll or how to get sprites into the border. The 64 doesn't have the frontier quality it used to have.

But part of the reason is also the feeling that 64 users are less active than they used to be. We have a wider games software base now than when GAC was actually seen as a major commercial threat to a similar



• 3-D Construction Kit: will it's worth ever be fully realised?

productivity tool that was already established at the time (ie *The Quill*). It's funny. Almost every enthusiast you talk to now, regardless of the machine they own, will happily wax lyrical about the potential of

virtual reality. And yet with what might be the first affordable form of it (albeit a microcosmic version) just around the corner, the chances of it making a major impact in the way people use their 64s is slim. Oh, well. Might as well look forward to autumn then. That's when the next clutch of carnage clones are due.

FINAL FACTS

Those of you who would like to stun the tired world of 64 users with your undoubted talents but who haven't yet mastered the art of programming might be interested to know that world famous Phil South is currently running a BASIC tutorial in *Commodore Format*. In conjunction with this august journal's own series on the same it could take you quite far.

And finally, I've seen *St Dragon* (by Storm) and there are plenty of nice things I could say about it instead of moaning that its main problem is that it's too easy to finish. Ah, my life.

Sean Masterson

spectrum

EXPAND YOUR SAM

The new year seems to be starting pretty well for the SAM Coupé. SAM Computers Ltd has three shiny new products for its machine which can only be considered A Very Good Thing Indeed.

Firstly there's MasterDOS. This is an extension to Coupé DOS for advanced users and programmers. For the £14.95 asking price MasterDOS allows root directories to be created (as in MSDOS) so you can store, for example, FLASH! screens separately from games. Rather impressively, you can also set up a RAM disk with the utility so that fast loading and copying is possible. Meanwhile advanced programmer types will go a bundle on the way MasterDOS permits random access and serial files.

The program has been written by SAM BASIC author Andy Wright and SAMCO claims it will "be an invaluable tool for anyone who takes their SAM Coupé seriously."

Next there's some ware of a decidedly harder variety with SAMCO's 1Mb memory pack. This should satisfy Coupé owners lusting for more power with the interface providing an extra 1Mb of external memory. Unfortunately it can't be used in conjunction with BASIC but expect software writers to make use of all that rippling extra memory soon.

If you really want a big memory you can whack four of the packs together and own a SAM Coupé with a throbbing, pulsating and potentially world dominating 4.5Mb. Power mad types can buy a memory interface for £79.95.

The increasing amount of hardware for the SAM means congestion problems around the Coupé's single expansion interface. Hence the release of the SAMBUS, a nifty piece of kit allowing a further four interfaces to be connected up to our blue footed chum. SAMCO has also thrown in a real time clock and because some interfaces demand extra power you can also connect an optional power supply unit to the SAMBUS enabling it to handle any add on you care to throw at your Coupé, from printer to Peruvian Rug Weaving Robot. The price is five pence short of £50 with the optional power supply costing £19.95.

As well as all the above nifty sounding stuff the Coupé should be getting its first spread sheet fairly soon. GM Software of 48 Main Road, Cryant, Neath SA10 8NP is currently slaving over a hot SAM working on GM-Calc. It's quite a way from completion at the moment but the finished one should be menu controlled and configured to 26 columns by 15 rows with each cell comprising nine characters. I've already mentioned their £4.95 database



(South East)

THE BIGGEST SHAREWARE CO IN USA NOW OPERATING IN BRITAIN

AMIGA

- AMG-101: WHEEL OF FORTUNE - Clone of the classic TV show.
- AMG-115: BULLRUN - Civil war strategy game.
- AMG-296: BLIZZARD - A 'Uridium' clone. A classic!
- AMG-120: BOULDER - Boulderdash clone.
- AMG-130: AMOEBA INVADERS - Clone of the classic with digitised sounds.
- AMG-247: GAMES - Blue Moon, Solitaire & Diplomacy (1 Mb).
- AMG-315: Q-BERTY - A classic 'Q-Bert' clone.
- AMG-137: SINKING ISLAND 2 - Text/graphics adventure (2 disks).
- AMG-148: BUSINESS 2 - VC Spreadsheet clone. Excellent!!
- AMG-142: MCAD - A full featured CAD program. (1 Mb)
- AMG-129: BUSINESS PROGRAMS 1 - Includes address book, mail manager, label printer & more.
- AMG-149: WORDWRIGHT - Word processor with spelling checker.
- AMG-216: ULTRA PAINT - An excellent painting program with many capabilities.
- AMG-158: AIRWAR - War version of 'Flight Simulator' with 3D graphics.
- AMG-161: BATTLEFORCE - Ideal for battletech players. Up to 4 players can play each other or against the computer.
- AMG-215: CASINO GAMES - Many fun card & casino games with documentation.
- AMG-159: STAR TREK THE GAME - Featuring digitised sounds (1Mb + 2 drives required).
- AMG-176: HORROR DEMO - Exploding head, dismembered arms. 'X' rated.
- AMG-182: TOILET PAPER AD - Amazingly funny demo with digitised speech. 'X' rated.
- AMG-183: SAFE SEX DEMO - Another fantastic digitised demo. Collectors item!!
- AMG-171: DELIRIOUS 1 - Eddie Murphy at his best. (2 disks).
- AMG-173: DELIRIOUS 2 - More from Eddie. (2 disks).
- AMG-199: MONTY PYTHON - 'The Secret Policemans Ball' digitised.
- AMG-261: THE WALL - Digitised 'Pink Floyd' song.
- AMG-507: BLOW FLY - Another digitised speech demo (really funny). 'X' rated.
- AMG-520: LAUREL & HARDY - digitised animations of the duo
- AMG-515: SCANNERS DEMO - Not for the squeamish. 'X' rated (1Mb recommended).
- AMG-501: BUDBRAIN DEMO - Must be one of hottest demos of the year. 'X' rated.
- AMG-264: FANTASY SLIDESHOW - 17 great fantasy pictures in digitised HAM format.

ST

- ST-151: BOLO - An incredible 'Breakout' game. Excellent graphics & gameplay!
- ST-150: STOCKS & BONDS V3: Simulation of the stock market featuring digitised sounds.
- ST-149: AIR WARRIORS: An 'Online' game similar to 'Flight Simulator'
- ST-148: STAR TREK - Written in STOS with digitised sounds.
- ST-162: COLOSSAL CAVE ADVENTURE - The original game that started it all (DS drive)
- ST-111: GAMES 15 - Cribbage, Blackjack & Stud Poker.
- ST-108: GAMES 12 - Tennis, American Football, Darts & more.
- ST-107: GAMES 11 - Monopoly, Othello, Yahtzee & Backgammon.
- ST-112: GAMES 16 - Taipan (rule the seas in the 1800's), Trucker (18 wheeler simulation) + more.
- ST-102: GAMES 6 - Wheel of Fortune! The game.
- ST-304: PLANETS - A guide through the solar system (DS drive).
- ST-305: PLANETARIUM - An excellent program. In the top ten PD of 1990.
- ST-596: OPUS - The BEST spreadsheet on ST (1Mb).
- ST-197: ST WRITER ELITE V3.8 - The best PD word processor on the ST today.
- ST-004: VISICALC CLONE - A VC spreadsheet with manual
- ST-580: WHAT THE BUTLER SAW - 'X' rated animations.
- ST-575: MADONNA - Slideshow of Madonna nude. 'X' rated.
- ST-439: ROBOCOP - The best Robocop demo yet (2 DS + 1Mb).
- ST-449: PREDATOR - Featuring excellent animation & digitising.
- ST-438: SCANNERS - Exploding head. Not for the squeamish. 'X' rated (DS 1Mb).
- ST-437: TOILET PAPER AD - A classic demo featuring digitised speech. 'X' rated.
- ST-316: STAR TREK - The ultimate Star Trek demo (DS 1Mb).
- ST-417: WHEN HARRY MET SALLY - Animation from that classic scene in the film.
- ST-268: DELIRIOUS - Eddie Murphy at his best (2 x DS).
- ST-372: RAW - Eddie Murphy again!! 'X' rated.
- ST-316: THE RUN - Classic animation featuring a police car chasing a criminal.
- ST-312: WALKER 1 - That classic animation of the AT-AT walker from Star Wars.
- ST-278: CALIFORNIA RAISINS - Excellent animated demo featuring those raisins singing 'I heard it through the grapevine'.

Phone or write for further information & bargains.

This is just a small list from our catalogue. Phone us for a free copy.

Prices: £2.00 per disk 1-9, £1.75 per disk 10-19,

£1.50 per disk 20-29

All prices subject to VAT. PC & Macintosh catalogues also available

GEMINI SHAREWARE
10 WARWICK AVENUE
SLOUGH SL2 1DX

TELEPHONE:
0753 28183



VISA

AMIGA DEALS - CLEARANCE PRICE

AMIGA 500 STANDARD PACK

- ★ A500 computer ★ 512k RAM ★ 1Mb disk drive ★
- ★ mouse ★ modulator ★
- ★ power supply ★ operation-manuals ★
- ★ workbench disks, etc. ★

£299.95

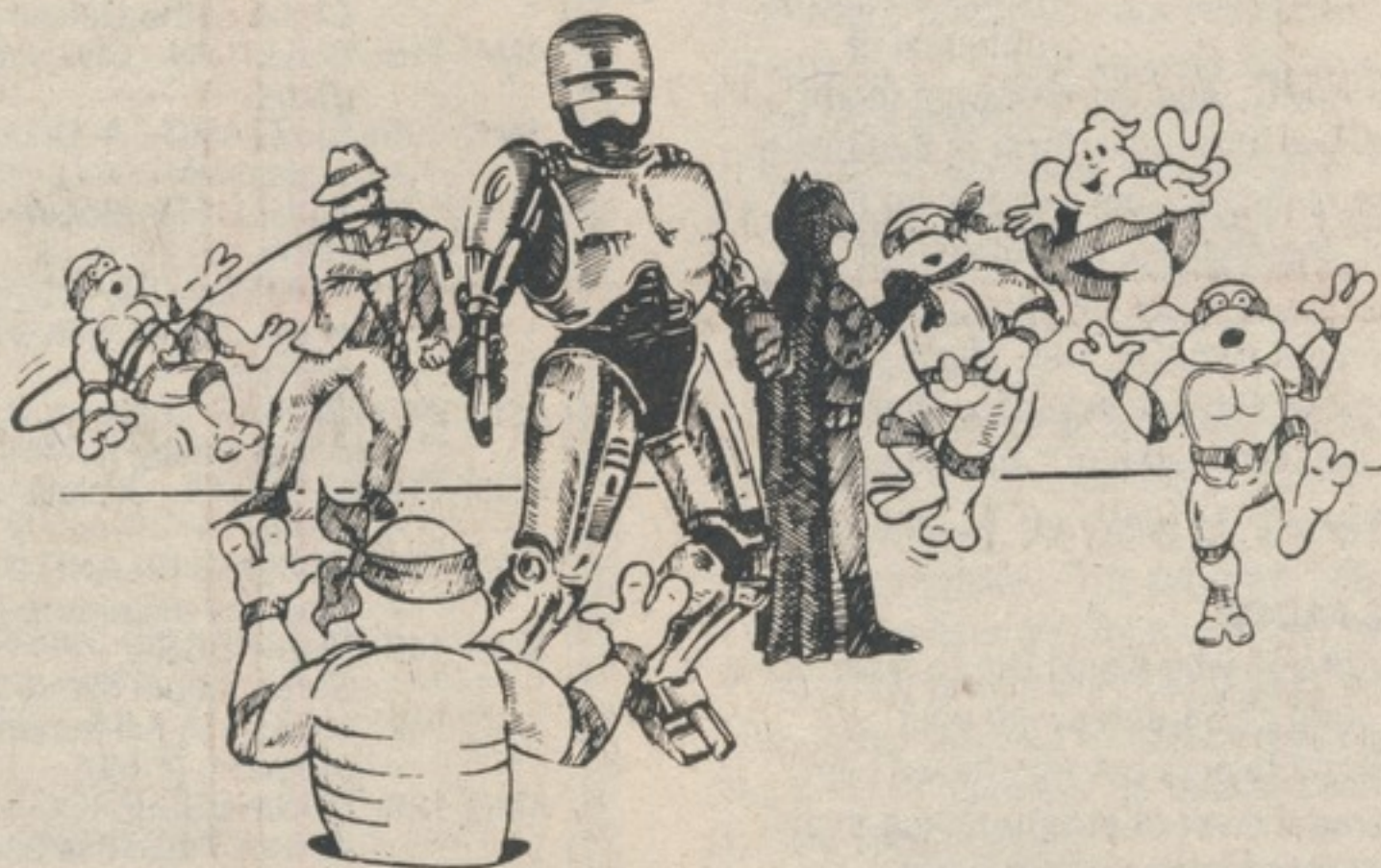
★ VERY LIMITED STOCKS
exclusive to N.C.E readers



MOVE OVER TURTLES - ROBOCOP AND HIS PALS ARE IN TOWN!

ROBOCOP

BATMAN



INDIANA
JONES

GHOSTBUSTERS II

AMIGA SCREEN GEMS PACK featuring ROBOCOP AND FRIENDS

Just Look At What You Get

- ★ Amiga as in standard pack
- ★ Days of Thunder
- ★ Shadow of the Beast II
- ★ Back to the Future II
- ★ Nightbreed
- ★ Deluxe Paint II

- PLUS *exclusive* to Dowling
- ★ ROBOCOP
 - ★ BATMAN the Movie
 - ★ GHOSTBUSTERS II
 - ★ INDIANA JONES and the Last Crusade

All for the incredible price of **£369.95**

THE ALL NEW ULTIMATE GAMES PACK

Take the pack on the left featuring Robocop etc and add the following:
EXCLUSIVE DOWLING MEGA TEN GAME PACK comprising RVF HONDA, DATASTORM, DUNGEON QUEST, E-STORM, GRAND MONSTER SLAM, KID GLOVES, POWERPLAY, SHUFFLEPACK CAFE, MICROPROSE SOCCER, TOWER OF BABEL.

Total RRP of games over **£229**

PLUS

- ★ Megablaster Joystick ★ High Quality Mousepad ★ Dustcover

All for the unbeatable price of **£399.95**

A590 20MB HARD DRIVE CLEARANCE

- ★ Official Commodore Hard Drive
- ★ Sockets for 2Mb RAM
- ★ Built in PSU

STOCKS VERY LIMITED
exclusive to N.C.E. Readers

£249.95

PACK 1 AMIGA PERIPHERAL PACKS PACK 2

Megaboard Ram Expansion.....RRP **£49.95**
40 capacity lockable disk boxRRP **£9.95**
20 3.5" DS/DD disks with labels ...RRP **£19.95**

TOTAL RRP **£79.85**PACK PRICE **£39.95**

Cumana CAX 354 disk driveRRP **£89.95**
Megaboard Ram ExpansionRRP **£49.95**
40 capacity lockable disk box.....RRP **£9.95**
20 3.5" DS/DD disks with labelsRRP **£19.95**
3.5" disk drive cleaner kit.....RRP **£9.95**

TOTAL RRP **£179.75** ...PACK PRICE **£99.95**

COMPUTERS

UNIT S 48-50 TYNE ROAD, SANDY, BEDS, SG19 1SA

DOWLING

THE NEW AMIGA 1500 ONLY £599* INC VAT

* when you trade in your old working Amiga 500

Not only does the Amiga 1500 accept all standard Amiga 2000 peripherals but can also be upgraded to full IBM compatibility. Just feast your eyes on what you get:-

- ☆ Latest Commodore Amiga 1500 computer complete with 1Mb of Ram (expandable to 9Mb) and 2 x 3.5" 880Kb disk drives.
- ☆ Platinum Works:- An integrated word processor, database and spreadsheet package.
- ☆ Deluxe Paint III :- Paint/Animation package.
- ☆ Populous & Sim City:- Two great strategy games.
- ☆ Battlechess:- The most exciting game of chess you'll ever play.
- ☆ Their finest hour:- Battle of Britain brought to life.
- ☆ A-Z of Computer jargon.
- ☆ "Get The Most Out Of Your Amiga":- Two introduction books.
- ☆ Optional 1084S Stereo colour monitor.

How do I take advantage of this great offer?

Just package your working Amiga complete with Mouse, Modulator, power supply and give us a call - we'll even arrange collection.

A1500 trade-in price £599 A1500 trade-in price with colour monitor £799

ATARI ST DEALS - Choose your own pack

DISCOVERY PLUS PACK	TURBO PLUS PACK	ULTIMATE GAMES PACK
<ul style="list-style-type: none"> ☆ Atari ST Computer ☆ Bombjack ☆ Carrier Command ☆ Outrun ☆ Space Harrier ☆ First Basic ☆ Neochrome ☆ STOS Games Creator ☆ ST Tour Tutorial ☆ Discover the Atari ST PLUS -exclusive to Dowling ☆ Konix Megablaster Joystick ☆ High Quality Mousepad ☆ Dust Cover 	<ul style="list-style-type: none"> ☆ Atari ST Computer ☆ Anarchy ☆ Blood Money ☆ Dragons Breath ☆ H.K.M. ☆ Impossible Mission II ☆ Indiana Jones ☆ Outrun ☆ Super Cycle ☆ First Basic ☆ Hyperpaint II ☆ Music Maker II ☆ STOS Games Creator PLUS - exclusive to Dowling ☆ Konix Megablaster Joystick ☆ High Quality Mousepad ☆ Dust Cover 	<ul style="list-style-type: none"> ☆ Atari ST Computer ☆ All software listed in "Turbo" pack PLUS - exclusive to Dowling ☆ Drivin' Force ☆ Asterix ☆ Trivial Pursuit ☆ Skweek ☆ Pipemania ☆ Rock 'n' Roll ☆ Rick Dangerous ☆ Onslaught ☆ Live & Let Die ☆ Chess Player 2150 PLUS - exclusive to Dowling ☆ Konix Megablaster Joystick ☆ High Quality Mousepad ☆ Dust Cover

	520STFM	520 STE 512K RAM	520 STE 1 MEG RAM
DISCOVERY PLUS PACK	£259.95	£329.95	£369.95
TURBO PLUS PACK	£299.95	£339.95	£379.95
ULTIMATE GAMES PACK	£329.95	£369.95	£399.95

UPGRADED 520 STE DEALS

520 STE with 1 MEG RAM £349.95	520 STE with 2 MEG RAM £419.95	520 STE with 4 MEG RAM £499.95
--	--	--

THE NEW 200 SERIES FROM

star

"The best printers just got better!"

LC-200 FACT FILE

- ☆ Multi-purpose 9-pin, 80 column dot matrix printer with colour
- ☆ Black and colour ribbons included as standard
- ☆ Electronic dip switches (see LC24-200)
- ☆ 180 cps draft elite/45 cps near letter quality
- ☆ High speed draft facility 225 cps at 12 cpi
- ☆ Swivel selectable push or pull tractor
- ☆ Bottom feed

RRP £297.85

**OUR PRICE
£199.95**

STAR LC10 MONO £149.95

LC24-200 FACT FILE

- ☆ Versatile 24-pin 80 column dot matrix printer
- ☆ 200 cps in draft elite/67 cps in letter quality mode
- ☆ 10 resident LQ fonts
- ☆ A high speed draft facility of 222cps at 10cpi
- ☆ Swivel selectable push or pull tractor
- ☆ Bottom feed
- ☆ Advanced paper parking with sheet feeder installed
- ☆ The economy of first and last line printing
- ☆ 7 K-byte buffer expandable to 39K-bytes

RRP £366.85

**OUR PRICE
£239.95**

STAR LC24-10 £199.95

LC24-200 COLOUR FACT FILE

- ☆ Multi-purpose colour version of the 24-pin LC24-200
- ☆ Seven colour printing - black, purple, orange, green, pink, blue and yellow
- ☆ 30 K-byte buffer expandable to 62 K-bytes
- ☆ 10 resident letter quality fonts: Sanserif, Times Roman, Courier, Prestige, Script and italic versions
- ☆ Electronic dip switches operable from the push button front control panel (as the LC24-200 mono version)

RRP £424.35

**OUR PRICE
£279.95**



HOW TO ORDER



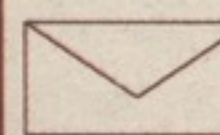
BY PHONE



Simply call our head office quoting your Access/Visa number on

(0767) 681760

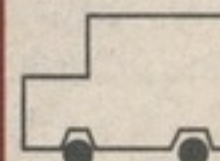
(8 lines)



BY POST

Make cheques, building society drafts or postal orders payable to:

Dowling Computers



DELIVERY (UK Mainland, most areas)

Please add £6 courier delivery for orders over £100, add £2 p&p for orders under.

★★★★★★★★★★★★★★★★★★★★ GOLD CLUB SERVICE

- ★ 7 day money back guarantee if not completely satisfied
- ★ 30 day exchange for new policy should a fault occur
- ★ 1 year guarantee giving FREE collection and delivery service should a fault occur
- ★ Exclusive gold card with personal membership number entitling you to special offers
- ★ All this for a nominal £10 per item over £100

PRICE PLEDGE

We know the majority of you prefer to buy from us but are sometimes tempted by smaller companies offering a £1 or so price difference. That is why we have now introduced our

"PRICE PLEDGE"

"WE WILL MATCH ANY PRICE OFFERED ELSEWHERE ON A SAME PRODUCT BASIS"

★ Subject to stock

WHY CHOOSE DOWLING?

- ★ **ESTABLISHED OVER 4 YEARS**
With a growing reputation for "putting the customer first". We intend to satisfy many more customers for years to come
- ★ **TECHNICAL SUPPORT/ON-SITE ENGINEERS**
Employing over 20 specialist staff, we are equipped to deal with the majority of queries
- ★ **FULL TESTING PROCEDURE**
All computer hardware is tested prior to despatch, proving Dowling's commitment to customer care

So choose Dowling and put our reputation to the test!

TELESALES ORDER LINE 0767 681760 (8 lines)

program in a past column. More details in a future column.

ANNOY YOUR NEIGHBOURS

Robert Jacobs of London has written asking, nay demanding, to know more about the Cheetah SpecDrum. He wants to know simply "if its any good" and "how well does the Speccy recreate an authentic drum sound?"

Well, perhaps surprisingly, I can confirm it's very good indeed and tell you that to my ears at least the drum sound is easily good enough to annoy the neighbours. That's providing you have suitably loud amplification, of course, as the SpecDrum needs to be connected up to a stereo or ghetto blaster so that you and your immediate family to enjoy the variety of loud thumpy thumpy noises it can produce.

It's been around quite a few years now which means you can often buy it for bargain prices. For example, Datel Electronics (Tel 0782 744707) is selling them for £14.99 complete with extra Latin and Afro drum kit software. What an absolute bargain!

RETURN OF THE POKE MONSTER

He's back! After an absence of at least a week or two it's good to see the triumphant return of our old pal and mucker, Miktor - aka Mark Harris of Faversham, Kent. As per usual his planet-sized brain has managed to come up with another load of pokes and cheats.

Here's an infinite credits poke routine for Chase HQ II. To get it

working simply type it in, save to tape if you want, then type RUN and start your Chase HQ II tape from the beginning.

```
10 CHASE HQ II (CREDITS)
20 CLEAR 3E4 : FOR N=63615 TO 63664
30 READ A : POKE N,A : NEXT N
40 PRINT "START 'CHASE HQ II' TAPE"; USR 63615
50 DATA 221,33,254,174,17
60 DATA 16,16,62,255,55
70 DATA 205,86,5,48,241
80 DATA 33,1,2,34,0
90 DATA 191,195,93,175,33
100 DATA 169,248,17,144,91
110 DATA 1,20,0,237,83
120 DATA 51,190,237,176,195
130 DATA 13,191,62,255,50
140 DATA 190,149,195,223,190
```

And there's more. Here's a correction to one of Mark's cheats I printed a month or so ago. *Midnight Resistance* - Type I AM AN OCEAN GAMES TESTER. In game W + FIRE Weapons, B + BACKFIRE Backpack Also 128K only, redefine keys and type WE WANT TO HEAR MUSIC.

Another huge dollop of fawning thanks go to Mark!

Have you got any hints, cheats, pokes, routines or tips for the Speccy or SAM? They can help with games, utilities, programming or just plain using. Send everything relevant to: Robin Alway, The Spectrum Column, New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

Robin Alway



HANDS ON EXPERIENCE

There's little doubt that MIDI has revolutionised the face of modern music production. However there must be an army of musicians out there who remain baffled by the whole process. Hands On Midi software has recognised this and produced a very unique product in the process.

Hands On has transcribed some of the more popular songs of recent years into a MIDI format. What this means is that if you own Steinberg Pro 24 sequencer, you can load up the MIDI file and see exactly how a song is constructed, drum patterns and all. Apparently some of the musicians whose music has been converted by Hands On, have purchased the song to see how MIDI works for themselves. Two programs, namely Gig and Masterclass are available now.

Songs in the catalogue include *Ride On Time* by Black Box, *Bad* by someone called Michael Jackson and *Toccatta and Fugue* by Rap Meister Bach. The appeal of the software is limited to owners of Pro 24 so it would seem sensible for Hands On to convert the data to some other formats, like Notator or Cubase.

Contact Hands On at Midi Software Ltd, 14 Lodge Road, Bedhampton,

Havant, Hants, PO9, 3LL, or telephone 0705 452628.

COMPUTER SHOPPER SHOW, PART 27

The latest in a seemingly endless line of computer shopper shows is in the pipeline. The box-shifting sections of the computer industry love these events because they can off-load zillions of dated games on the public for five quid a throw. But if you know what you're looking for then it is possible to pick up the odd bargain. The spring shopper show takes place from the 10 to 12 of May at Alexandra Palace, in London.

INGLISHE AZ SHEE IZ WRIT

Let's face it, you can't all write as well as us journalists (pause while sub-editor wets himself laughing). The major problem with most people's writing is bad grammar (innit) and up to now there's been little you can do about that. Enter an enterprising chap by the name of Phil Comeau, who lives in Canada.

Mr Comeau has written *Gramslam*, a grammar checker which works along very similar lines to a standard spell checker. The program searches out phrases and words which are wordy or repetitive and compiles a report on them. This means that you can search through letters, memos, essays and the

ATARI ST ★ ATARI ST ★ ATARI ST ★ ATARI ST ★ ATARI

A brilliant offer for readers of New Computer Express!

Devpac ST 2

FROM HISOFT ONLY £44.95

Devpac ST Version 2 is widely regarded as the most powerful assembly language development system for the Atari ST. It incorporates a debugger, stand-alone assembler and a fast linker

IT INCLUDES:

- **GenST** Assembler is a high-performance, full-featured, two-pass Motorola standard macro assembler at up to 75,000 lines per minute. It has multiple modules and sections, repeat loops and macro calls that maybe nested as deeply as memory allows.
- **MonST** Debugger is an advanced symbolic monitor, debugger and disassembler. Now in addition it can offer Multiple window display, full expression evaluator, up to 22 significant characters in symbols, viewing of source files and conditional breakpoints.
- **Example Files** of a wide variety including a full GEM type windowing application and an example desk accessory.

The package comes complete with an extensive ring-bound manual plus notes on the various operating system levels and debugging strategies.

Order now by phone from the NCE mail order service or send the coupon to our FREEPOST address.

HOTLINE NUMBER 0458 74011

DevpacST 2
version 2

Complete Assembler/Debugger System
for the Atari ST Computers

**SAVE
£15**

Yes, I would like to order a copy of
Devpac ST 2

Name _____

Address _____

Tel No _____

I would like to pay by **Access Visa
Cheque PO**

Please debit my credit card
No _____

Expiry Date _____

Tel. No _____

Send & make cheques payable to
**Future Publishing, FREEPOST, The Old
Barn, SOMERTON, Somerset. TA11 7BR**

like and remove all the wordy wordiness which wordily worms its way into your wordy prose! Over 1200 common grammar and stylistic problems are dealt with, as well as punctuation errors?

Version 3, costs \$42.95 (excluding airfare costs) and is available from Phil Comeau, 43 Rueter Street, Nepean, Ontario, Canada, K2J 3Z9. Telephone 0101 613 825 6271.

TRACKER CUT

Phil Harman of MPH has just revealed that *TCB Tracker*, that stonking piece of music software, has taken a major price cut to £24.99. The program, which previously retailed at over £40, enables you to play four part songs comprised of samples. These can then be played back without the program in a machine code or Basic program. MPH Software is on 0603 503382.

UK DOUBLE CLICK DISTRIBUTERS

The replacement desktop by Double Click software which I covered in last week's column is now available from a British distributor. Softville Computer Supplies is selling the natty software for £20.55 (inc. P&P). The company is also distributing *DC Utilities* for the same price. Write to Softville Computer Supplies, Unit 5, Stratfield Park, Elettra Avenue, Waterlooville, Hampshire, PO7 7XN or telephone 0705 266509.

COMPUSERVE ST

One of the more interesting aspects to arise out of the communications

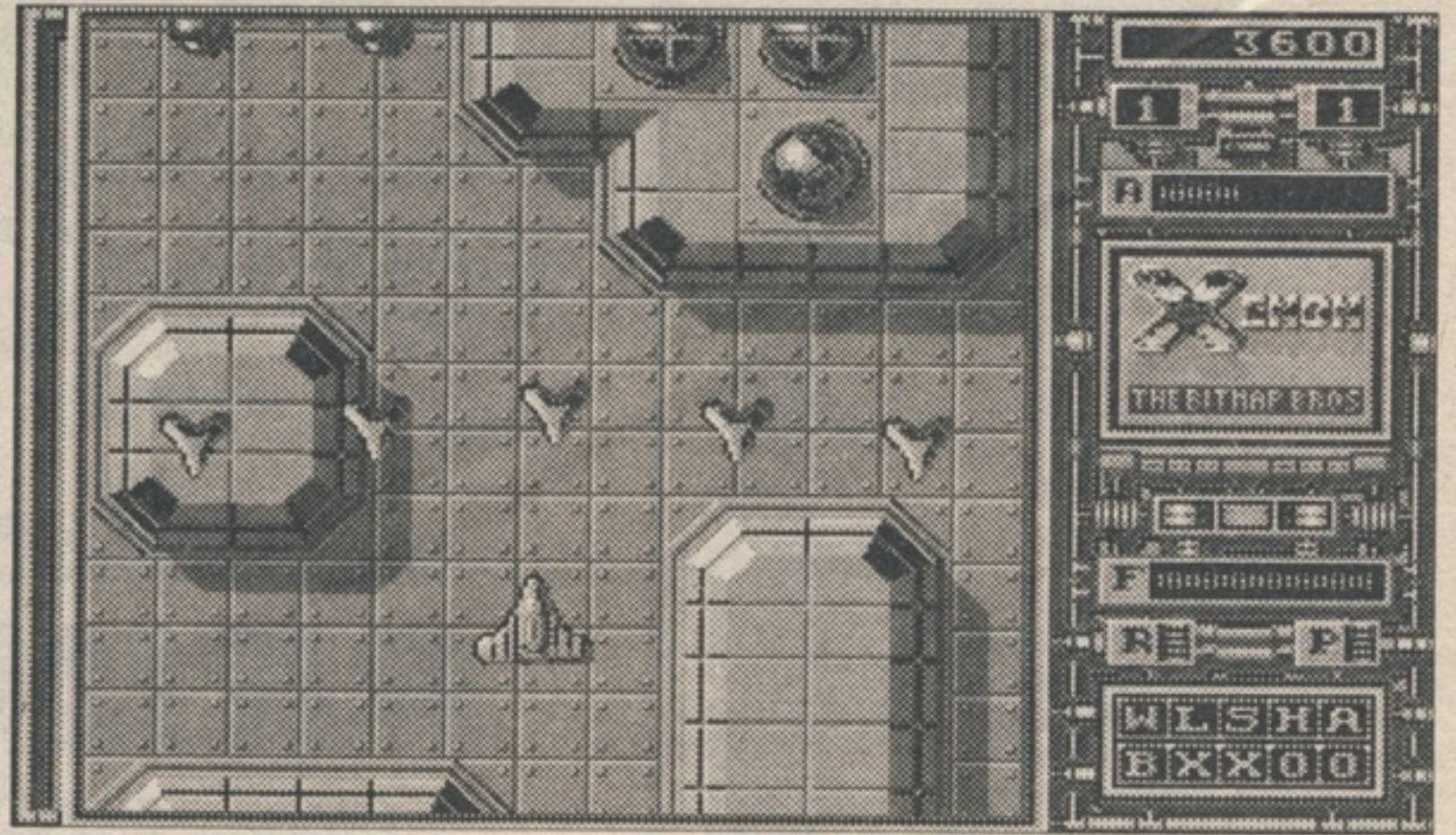
revolution, is the ability to communicate with foreign computers. Of particular interest are American databases, which boast massive subscriber support. The biggest of them all is CompuServe, which through a network spread across the states enables you to access vast amounts of data.

Of particular interest to people reading this column is the Atari section on CompuServe. Three main forums enable American ST owners, access to both hobbyists and professional companies alike. The Arts forum includes thousands of pictures in all popular formats as well as graphic utilities.

The Z-Net and ST Report on-line newsletters are also in this forum. In the productivity forum you'll discover masses of public domain software, covering everything from games to business. The third section is the Vendor's forum. Here, 20 of the largest American hardware and software companies have their own libraries, where updated software and news is uploaded for public consumption.

While these three forums are likely to be of most interest to ST owners, it would be stupid to just restrict CompuServe usage to these areas. Electronic Mail, shopping, on-line news, cooking, recipes and holiday guides are just a few of the other areas you could access.

CompuServe is reached through the Istel or Packet Switching Network in this country which means you only pay a local telephone call charge. You then pay



• *Xenon: just one of a horde of old titles coming out at budget prices.*

the equivalent of \$22 per on-line hour, along with a once only subscription fee of £19.95. For more info call CompuServe free on 0800 289458.

PLAY LIKE A GOD

The Bitmap Brothers, those saviours of ST gaming, have come up with a brand new game. *Gods* is an eight way scrolling platform game which boasts aliens with an IQ. The Bitmaps decided that they could bring new light to the jaded platform format by combining strategy and puzzle elements with a hard shoot-'em-up flavour.

The mythologically-influenced aliens can perform party tricks, such as dodging your bullets and chasing you through mazes. However if they prove to be too tough for your tastes, the program will detect this and make life

easier for you. *Gods* will be available from Renegade by mid to late February.

BUDGET BLASTING

Software houses, aware of the fact that everyone's skint after Christmas, have released a whoop of cheap games. Mastertronic, have let loose *Silkworm*, *Gemini Wing*, *Xenon* and *Double Dragon* on their 16 Blitz Plus label, each retailing at £4.99. The Action Sixteen range of games offers better titles at twice the price including *Colorado*, *Hostages* and *Gridrunner*.

Software house Kixx has also released some old games on budget. However it has gone for a middle of the road price of £7.99. *Thunder Blade*, *World Class Leaderboard* and *Blateroids* are three of the games in their series.

Andy Hutchinson

NEW COMPUTER EXPRESS

Britain's biggest selling computer weekly, packed with the latest news, reviews and technical tips for **your machine.**

SAVE OVER £6

off the news-stand price when you take out a subscription to New Computer Express today

LIMITED OFFER
APPLY TODAY

54 issues for only £31.35

or to put it another way...
get your copy of NCE delivered to your door for the old price of just 58p a copy!

To take advantage of this extra special offer, complete the coupon below and return it immediately or, better still... telephone our credit card hotline right now on 0458 74011 to book your guaranteed copy every week.

Please enter my subscription to New Computer Express at the special discount rate ticked below.

☐ UK - 54 issues - £31.35

☐ Europe - 54 issues - £63.75

☐ Rest of World - 54 issues - £89.15

N.B. All overseas subs are sent by Airmail for speed and safety.

Please make cheques/PO payable to Future Publishing Ltd and send with this coupon to:

NEW COMPUTER EXPRESS, FREEPOST, SOMERTON, TA11 7BR.

Name: _____

Address: _____

Postcode: _____ Tel: _____

I wish to pay by (please tick as appropriate)

☐ Access ☐ Visa ☐ Cheque ☐ PO

Card No: _____

Expiry date: _____ NCE/SP/1090/K

PRINTER RIBBONS

All of our ribbons are GENUINE manufacturer ribbons - NO copies!

1 x LC10 Black Ribbon	£3.50
5 x LC10 Black Ribbons	£16.95
1 x LC10 Colour Ribbon	£5.20
5 x LC10 Colour Ribbons	£24.95
1 x LC24/10 Ribbon	£4.75
5 x LC24/10 Ribbons	£22.00
1 x LC200 Mono Ribbon	£5.00
5 x LC200 Mono Ribbons	£25.00
1 x LC200 Colour Ribbon	£10.00
5 x LC200 Colour Ribbons	£50.00
1 x LC24-200 Mono Ribbon	£5.00
5 x LC24-200 Mono Ribbons	£25.00
1 x LC24-200 Mono Long Life	£7.50
5 x LC24-200 Mono Long Life	£37.50
1 x LC24-200 Colour Ribbon	£11.00
5 x LC24-200 Colour Ribbons	£55.00
Swift 24 Mono Ribbons (each)	£5.00
Swift 24 Colour Ribbons (each)	£13.95
1 x Panasonic KXP1124 Ribbon	£8.95
5 x Panasonic KXP1124 Ribbons	£39.99

ATARI LYNX

NEW LOWER PRICES

Lynx Games Machine
(with free California Games) £119.00

Blue Lightning	£22.50
Chips Challenge	£22.50
Electrocop	£22.50
Gates of Zendocon	£22.50
Xenophobe	£23.00
Robo Squash	£23.00
Road Blasters	£23.00
Ms Pacman	£23.00
Shanghai	£23.00
Zarlor Mercenary	£23.00
Gauntlet 3	£25.00
Rygar	£23.00
Slime World	£23.00
Klax	£23.00
Paperboy	£23.00

GAMES COMING SOON

Blockout	3D Barrage	Scrapyard Dog
Cyberball	720 Degrees	Stun Runner
Flying Ace	A.P.B.	Super Soccer
Grid Runner	Basketbrawl	Superbowl
Lynx Casino		Turbo Sub
Ninja Gaiden		Vindicators
Pacland		World Cup Soccer
Pinball Shuffle		War Birds
Rampage		Xybots
Scrapyard Dog		

HP DESKJET 500

- * 120 cps in LQ, 240 cps draft
- * Non impact silent printing
- * 75 to 300 dpi
- * 100 x A4 sheet feeder
- * Optional plug in font cartridges
- * Optional Epson FX emulation
- * Notator V3 compatible
- * Calamus compatible
- * Cubase V2 compatible

£499
inclusive

AS USED TO PRINT THIS ADVERT

PRINTERS

All of our printers come with a parallel cable to suit Atari ST, Amiga and all standard PC etc (other cables available at extra cost - ask for details). All printers carry a full 12 months warranty. We only sell genuine UK stock - we do not offer inferior "grey imports".

Star **ALL INCLUSIVE PRICES**
NO HIDDEN EXTRAS IN OUR DEALS!

Star LC10 Mono (9-pin)	£155.00
Star LC200 Colour (9-pin)	£230.00
Star LC24-10 Mono (24-pin)	£210.00
Star LC24-15 Mono 15" (24-pin)	£399.00
Star LC24-200 Mono (24-pin)	£265.00
Star LC24-200 Colour (24p)	£295.00
Star XB24-10 Mono (24-pin)	£469.00
Star XB24-15 Mono 15" (24-pin)	£599.00

Panasonic

Panasonic KXP1124 (24-pin)	£249.00
Panasonic KXP1624 15" (24-pin)	£399.00
Hewlett Packard Deskjet 500	£499.00
Citizen 124D (24-pin) + s/feed	£225.00
Citizen Swift 24 (24-pin)	£299.00
Canon BJ10E Portable B/Jet	£339.00

PRINTER ACCESSORIES

Swift 24 Colour Kit	£34.95	Deskjet - FX85 Mod	£59.00
Star XB Colour Kit	£34.95	Deskjet - Ink Cart	£17.95



PHILIPS 8833 MKII

STEREO COLOUR MONITOR

The 8833 MkII is the perfect colour monitor for all ST and Amiga owners. With its high quality picture and stereo sound it really makes the STE or Amiga perform to it's full.

Ring today for details.

Supplied with 1 cable free of charge. Options are :-
Atari STE Stereo cable or Atari STFM cable or Amiga stereo cable

12 months on site warranty FREE!
with this monitor

£ 249.00

including vat and delivery

BLANK DISKS

BEST PRICES - BEST DISKS

All of our blank disks are guaranteed and supplied with labels. Our 3.5" unbranded disks are of the highest quality double sided media. All Sony Branded disks are boxed and supplied with labels. All disk prices include vat and delivery. Ring for prices on larger quantities.

QUANTITY	10	20	30	50	100
UNBRANDED 3.5" DS/DD	5.99	10.99	15.99	25.99	44.99
SONY BRANDED 3.5" 2DD	9.50	18.50	26.50	42.50	80.50
UNBRANDED 3.5" HD	14.95	27.95	39.95	59.95	114.95
SONY BRANDED 3.5" HDD	26.50	50.50	74.50	115.50	227.50
UNBRANDED 5.25" 360K	3.25	6.25	9.25	14.95	28.25
SONY BRANDED 5.25" 2D	7.95	14.95	21.95	34.95	68.95
SONY BRANDED 5.25" HDD	12.99	23.99	34.99	54.99	99.99

AMIGA

AMIGA A500 SCREEN GEMS PACK

A500 cpu, mouse, tv modulator, manuals, Workbench, Dpaint 2

and Days of Thunder, Back/Future II, Nightbreed and Shadow/Beast II

£359.00

AMIGA A500 BASE PACK

A500 computer, mouse, tv modulator, manuals, Workbench, etc

supplied 'bare' with no games software

£339.00

AMIGA A500 CLASS 90's FIRST STEPS

A500 computer, mouse, 1Mb Ram Expansion, manuals, Workbench, etc comes with DPaint II, Dprint II, Pro Write 2.5, InfoFile, Music Mouse, Lets Spell,

Logo, BBC Emulator, 10 Blank disks and mouse mat. . . .

£539.00

AMIGA A1500 PACK

A1500 1Mb ram computer with 2 x 3.5" drives, mouse 1084S Stereo Colour Monitor, and software : Platinum Works, DPaint 3

Populous, Simm City, Battle Chess, Their Finest Hour and 2 books

£1099.00

GAMES LESS THAN £3 EACH ?

Datastorm, Dungeon Quest, E Motion, Grand Monster Slam, Kid Gloves, RVF Honda, Suffle Puck Cafe, Soccer and Tower of Babel.

These games make up the AMIGA ASTRA PACK

available for only **£29.95** inclusive
* NB : Games are not available separately *

Screen Gems software	£19.95
512K Ram Upgrade with clock	£39.95
A590 20Mb Hard Disk drive	£279.95
A590 1Mb Ram Upgrade	£49.00
Roctec external disk drive	£73.00
Golden Image Handy Scanner	£195.00
Amiga Stereo Scart Lead	£9.99

All prices include VAT & delivery

ATARI STE + STFM

ALL ATARI STE PRICES INCLUDE VAT AND UK DELIVERY. ALL PRODUCTS CARRY A FULL 12 MONTH WARRANTY. ALL MACHINES ARE CHECKED PRIOR TO DESPATCH. PLEASE RING US BEFORE ORDERING TO CHECK STOCKS AND CURRENT PRICES. WILL YOU EVER WANT TO EXPAND YOUR STE'S RAM? ALL OF OUR ATARI STE COMPUTERS HAVE THE "PLUG-IN" RAM SOCKETS - OUR PRESENT STOCKS DO NOT REQUIRE A SOLDERED IN RAM UPGRADE UNLIKE THE MACHINES OFFERED BY OTHER MAIL ORDER COMPANIES. OUR PRESENT STOCKS ALSO HAVE THE NEW DMA CHIP SET FITTED ALLOWING TROUBLE FREE OPERATION WITH ATARI HARD DISK DRIVES.

ALL STE MACHINES COME WITH NEW CONTROL PANEL SOFTWARE

	512k	1mb	2mb	4mb
520STE STANDARD PACK. consists of the computer with mouse, tv lead, manual and all connecting leads etc. The Standard Pack is supplied with NO software.	£349.00	£375.00	£419.00	£529.00
520STE TURBO. consists of Standard Pack and STOS, Basic, Hyper Paint II, Music Maker II, 8 games (Indiana Jones, Impossible Mission II, H.K.M., Super Cycle, Outrun, Dragons Breath, Anarchy & Blood Money) and a joystick	£369.00	£389.00	£439.00	£549.00
520STE BUSINESS. consists of Standard Pack and also comes with K-Word 2 word processor, K-Data database, K- Spread spreadsheet and Metacomco Basic programming software.	£385.00	£405.00	£459.00	£565.00
520STE TENSTAR. consists of Standard Pack and Asterix, Chess Player 2150, Driving Force, Live + Let Die, Onslaught, Pipemania, Rick Dangerous, Rock n Roll, Squeek, Trivial Pursuit II and a joystick	£369.00	£389.00	£439.00	£549.00
520STE DISCOVERY. consists of the Standard Pack and STOS, First Basic, NeoChrome and 4 games (Carrier Command, Space Harrier, Outrun, Bomb Jack) and a joystick	£365.00	£395.00	£439.00	£555.00
520STFM STANDARD PACK. consists of the computer with mouse, tv lead, manual and all connecting leads etc. The Standard Pack is supplied with NO software.	£265.00			
520STFM TENSTAR. consists of Standard Pack and Asterix, Chess Player 2150, Driving Force, Live + Let Die, Onslaught, Pipemania, Rick Dangerous, Rock n Roll, Squeek, Trivial Pursuit II and a joystick	£295.00			
520STFM DISCOVERY. consists of the Standard Pack and STOS, First Basic, NeoChrome and 4 games (Carrier Command, Space Harrier, Outrun, Bomb Jack) and a joystick	£279.00			
520STFM BUSINESS. consists of Standard Pack and also comes with K-Word 2 word processor, K-Data database, K- Spread spreadsheet and Metacomco Basic programming software.	£310.00			

STE RAM KITS

DIY 1 KIT - 520STE to 1MB (2 x 256K cards)	£34.99
DIY 2 KIT - 520/1040 to 2MB (2 x 1MB cards)	£109.00
DIY 4 KIT - 520/1040 to 4MB (4 x 1MB cards)	£205.00
ALL RAM KIT PRICES INCLUDE VAT + DELIVERY. PLEASE CHECK YOUR STE CONFIGURATION BEFORE ORDERING	

IMPORTANT : ALL OF OUR ATARI STE s ARE UPGRADABLE AND DO NOT REQUIRE SOLDERING TO EXPAND THE MEMORY

ACCESSORIES YOU SHOULD HAVE

DISK DRIVE CLEANING KITS

3.5" - £3.50
5.25" - £3.50

MOUSE MATS

High quality neoprene soft mouse mats
£ 3.50

PRINTER STANDS

2 piece plastic printer stand with paper space underneath. (fits virtually any printer)
£9.50

MONITOR PLYNTH

The ideal desk space saver. The plynth is a metal unit on which the TV/monitor can stand, and the computer can slide underneath. For use with Atari ST, Amiga A500 or Archimedes.
£20.00

COMPUTER COVER

NEW! A solid perspex computer shield which fits both ST and Amigas. Protects keyboard and disk drive from dust, liquid and weights (within reason!!!). Be safe - not sorry.
£12.99

CONTRIVER PC MULTI DPI MOUSE

3 button mouse switchable between 100 + 800 dpi, 9-25pin adaptor, mouse mat, Image 72 Graphics software.
£24.99

DUST COVERS

Atari STFM/STE, A500, Star LC10 - only £6.99 each
SM124, 8833 - only £7.99 each

ST TRACKBALL

CONTRIVER 3 button trackball.
£29.99

DISK BOXES

3.5" 40 capacity - £4.95
3.5" 80 capacity - £8.95
5.25" 50 capacity - £5.95
5.25" 100 capa. - £9.95

NEW CONTRIVER 5 in 1 MOUSE

The new 5 in 1 mouse is compatible with the Atari ST, Amiga A500, Amstrad PC, Schnieder PC and Commodore PCIII. The package also includes a mouse mat and a mouse house.
£21.00

ST GAMES LESS THAN £3.00 EACH ?

Asterix, Chess Player 2150, Driving Force, Live + Let Die, Onslaught, Pipemania, Rick Dangerous, Rock n Roll, Squeek & Trivial Pursuit II. All of the above games are available in the Tenstar Software pack for only -

£29.95 - thats less than £3 each!
(requires double sided internal disk drive)

BEST PRICES MAIL ORDER

(DEPT NCE), UNIT A, GRAFTON PLACE,
WORTHING, WEST SUSSEX, BN11 1QX



(0903) 700714



TELESALES 10am till 12 midnight

Telesales : Mon to Sat Returns, Technical & Queries : Mon to Fri (10am till 6pm)

All prices include VAT and UK delivery unless otherwise stated. All prices / specifications / special offers are subject to change without notice. Goods usually despatched same day as cleared payment is received. (Please note : We allow a period of 7 days total for personal cheque clearance). Please make cheques/PO's out to BEST PRICES Mail order only. No callers. Thank You. ADD £6.50 INC VAT FOR NEXT WORKING DAY UK DELIVERY, ADD £32.50 INC FOR SATURDAY UK DELIVERY

BEST PRICES MAIL ORDER - PHONE OUR SALES HOTLINE (0903) 700714 - 10.00AM TILL 12 MIDNIGHT - MON TO FRI

Evesham Micros

**ALL PRICES
INCLUDE VAT
& DELIVERY**

Buy with confidence from one of the longest established companies in their field, with a reputation for good service and prices. We have invested heavily in a computer system to enable our Telesales staff to provide up-to-the minute stock information, coupled with highly efficient order processing. Our fully equipped Workshop enables us to carry out almost any repair on the premises. We feel sure that you won't be disappointed if you choose Evesham Micros.

**LOOK WHAT ELSE YOU GET
WHEN YOU BUY AN AMIGA
FROM Evesham Micros**

THESE FABULOUS GAMES:

Tracksuit Manager 90	Subbuteo	Treasure Trap
Block Alanche	Lost 'N' Maze	Discman
Battle Squadron	Diet Riot	Tank Battle
Tennis Cup	Jaws	

PLUS! A wordprocessor and spreadsheet

AMIGA

**SPECIAL
DEALS**

AMIGA 500 SCREEN GEMS PACK

Top-selling A500 package includes
'Night Breed', 'The Beast 2',
'Back to the Future 2', 'Days of Thunder',
'Deluxe Paint II' and TV modulator.

A500 SCREEN GEMS PACKAGE £ 379.00

**SPECIAL! A500 Screen Gems Package
inc. 512K RAM Clock Upgrade ... £ 399.00**

A500 Screen Gems Package PLUS 3 1/2" Drive £ 430.00

**A500 Screen Gems Package including
512K RAM/Clock Upgrade AND 3 1/2" Drive £ 450.00**

AMIGA 500 CLASS OF THE 90'S PACK

Includes A501 512K RAM Upgrade, TV Modulator, 8 software
Titles, 10 Disks, Mouse Mat, Video Tape and more

A500 CLASS OF THE 90's Package £ 549.00

A500 Class of the 90's Pack PLUS 3 1/2" Drive £ 600.00

AMIGA 1500 STARTER PACK

Includes A1500 computer (1Mb RAM, 2 x 3 1/2" Drives, 8 expansion slots),
Commodore Hi-Resolution Colour Monitor, plus Software including: 'Deluxe
Paint III', 'Battle Chess', 'Sim City' and 'The Works' (business software).

AMIGA 1500 STARTER PACKAGE £ 949.00

COMMODORE A590 HARD DISK

Good quality Commodore Hard Disk unit, including its own PSU
and built-in cooling fan. Features sockets for up to 2Mb of on-board
FASTRAM expansion (see below). 80ms Access time, with up to
2.4Mb/sec. transfer rate. Autoboos when used with Kickstart 1.3.

Commodore A590 Hard Drive (20Mb) £ 279.00

We are now supporting specially upgraded versions of the A590
incorporating NEC high capacity, fully autoparking SCSI drives
(25ms access time). SCSI interfaced hard drives offer a
substantial performance increase over conventional units.

A590 with fast 40Mb NEC SCSI Disk £ 399.00

A590 with fast 100Mb NEC SCSI Disk £ 599.00

A590 with 40Mb NEC Disk 2MB FASTRAM fitted £ 479.00

A590 RAM UPGRADES	A590 RAM Upgrades are fitted free of charge when bought with an A590.	512K Upgrade £ 31.95 1MB Upgrade £ 59.95 2Mb Upgrade £ 99.95
------------------------------	---	--

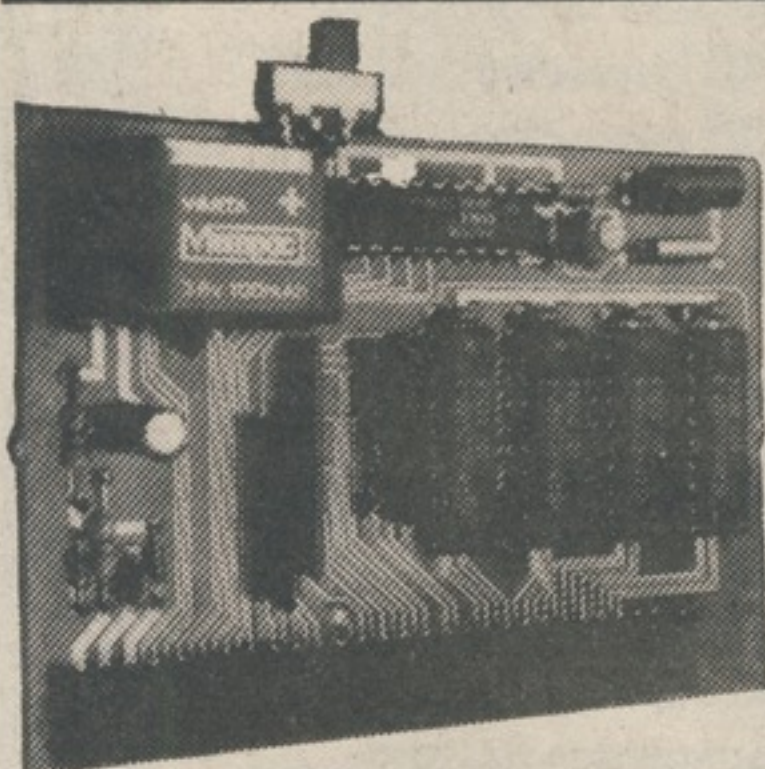
LYNX Portable Games Console



Now Only £119.00 including VAT
and delivery

LYNX GAMECARDS	Electro Cop	£19.95	Xenophobe	£19.95
	Slime World	£19.95	Blue Lightning	£19.95
	Klax	£19.95	Gates of Zendocon ..	£19.95
	Roadblasters	£19.95	Chips Challenge	£19.95
	Paperboy	£19.95	Shanghai	£19.95
	Rygar Warrior	£19.95	Rampage	£22.95
	Zaxxon	£19.95	Ms Pacman	£19.95
	Ms Pacman	£19.95	Gauntlet 3	£22.95

A500 SOLDERLESS RAM UPGRADES



**512K
RAM/CLOCK
UPGRADE**

ONLY £34.95

including VAT and delivery

512K RAM/CLOCK EXPANSION FEATURES:

- ☆ Direct replacement for the A501 expansion
- ☆ Convenient On / Off Memory Switch
- ☆ Auto-recharging battery backed Real-Time Clock
- ☆ Compact Unit Size : Ultra-neat design
- ☆ Only 4 low power consumption FASTRAMs

512K RAM Expansion also available without clock for only £29.95

1.5MB RAM EXPANSION BOARD

- ☆ Fully populated board increases total RAM capacity in an Amiga 500 to 2MB !
- ☆ Plugs into trapdoor expansion (as with 512K unit) ; connects to GARY chip
- ☆ Includes Auto-recharging battery-backed Real-Time Clock
- ☆ Socketed FASTRAM ICs for accommodating up to 1.5MB RAM

Unpopulated RAM board with clock	£ 39.95
RAM Board as above, with 512K FASTRAM installed	£ 59.95
RAM Board as above, with 1MB FASTRAM installed	£ 74.95
RAM Board as above, with 1.5Mb FASTRAM installed	£ 89.95

N.B. : The expansion board requires Kickstart 1.3 to operate - Kickstart 1.3 upgrade available from us for £29.95

Amiga & ST 3 1/2" Drives



- Very quiet
- Slimline design
- Cooling Vents
- Sleek, high quality metal casing
- Quality Citizen Drive Mechanism
- On / Off switch on rear of drive
- Throughport connector (Amiga)
- External Plug-in PSU (Atari ST)
- Full 1Mb Unformatted Capacity
- Long reach connection cable

ATARI ST VERSION :

£59.95

AMIGA VERSION :

£54.95

5 1/4" External 40 80 Track Drive also available for only £99.00

PRINTERS

All models include cable

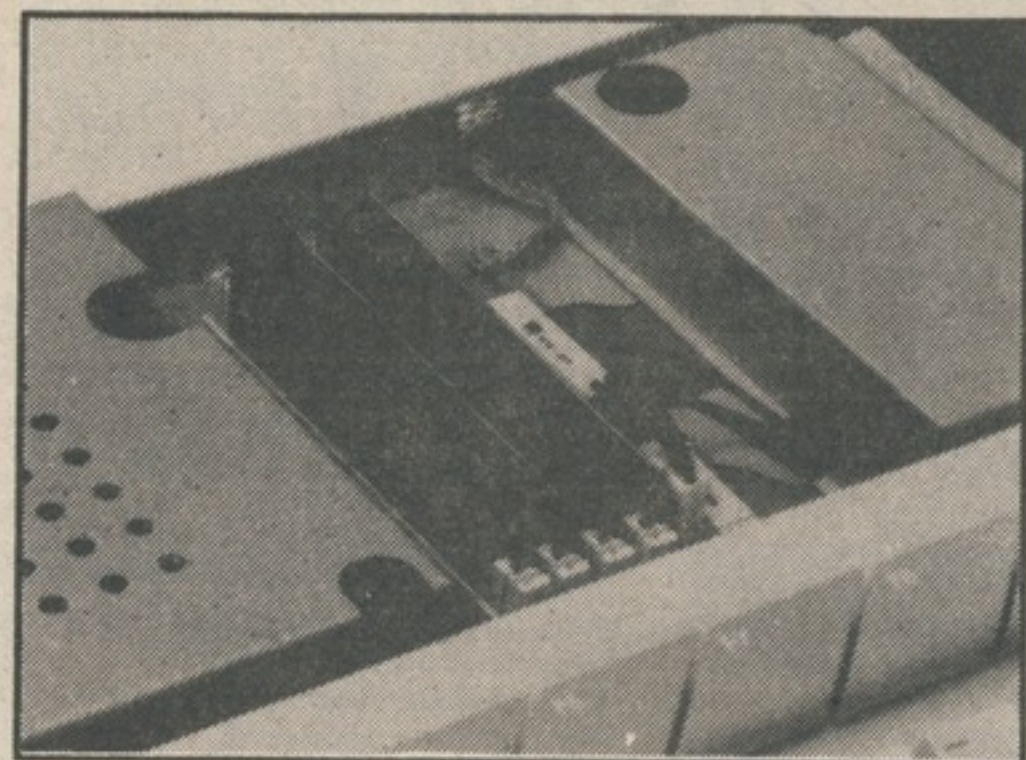
**EVESHAM MICROS
SPECIAL OFFER !**

All STAR printers
include 12 months
On-Site Maintenance

Star LC 10 9-Pin, 4 fonts, 144/36cps	£ 159.00
Star LC 200 9-Pin Colour, 4 fonts, 180/45cps ...	£ 209.00
Star LC 24-10 24-Pin, 4 fonts, 180/60cps	£ 215.00
Star LC 24-200 24-Pin, 5 fonts, 200/67cps	£ 249.00
Star LC 24-200C 7 colour version of above	£ 289.00

**Citizen ProDot 24 COLOUR Professional 24-pin colour
printer, 200/66cps. Fully featured, 2 years warranty.
Normal RRP £ 746.35, Special Offer price£ 269.00**

SOLDERLESS MEMORY UPGRADES FOR ST's



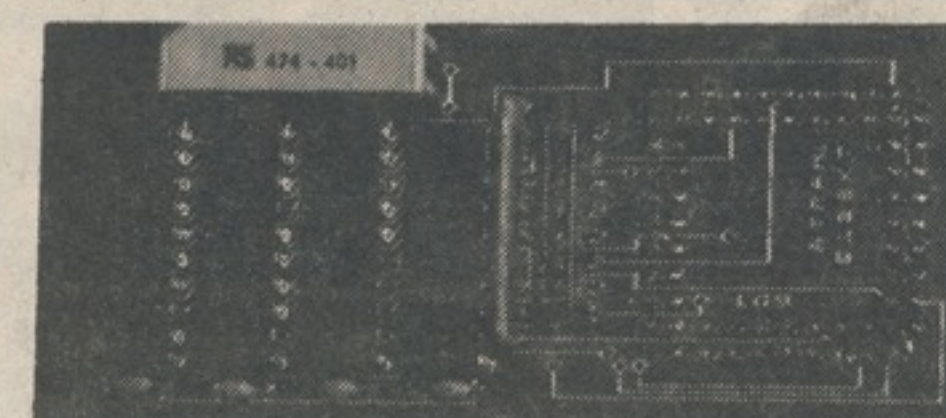
Upgrade the memory of your ST quickly and easily with our new, fully software compatible RAM upgrade board. Designed for pre-STE machines, the unit accepts SIMMS slot-in memory modules, making RAM fitting simplicity itself. No electronics knowledge needed! Available with or without RAM modules. Allows upgrade in stages of 1Mb, 2 / 2.5Mb and 4Mb, as and when necessary. Straightforward installation - full, comprehensive instructions provided.

- ✓ Fits any STF, STFM or MEGA series machine in minutes!
- ✓ Uses SIMMS RAM Modules for Effortless Upgradeability
- ✓ Probably the neatest ST RAM Upgrade available!

RAM Upgrade with board unpopulated	£59.95
RAM Upgrade With 512K RAM Installed - upgrades a 520 to a total of 1Mb RAM	£89.95
RAM Upgrade With 2Mb RAM Installed - upgrades a 520 1040 Mega1 to 2 2.5Mb	£174.95
RAM Upgrade With 4Mb RAM Installed - upgrades a 520 1040 Mega ST to 4Mb	£284.95

N.B. Due to the large variance in design of the Atari ST, there is a small minority of boards in existence which may require a little soldering.

PLUG-IN, SOLDERLESS RAM UPGRADE FOR ANY ATARI 520 ST

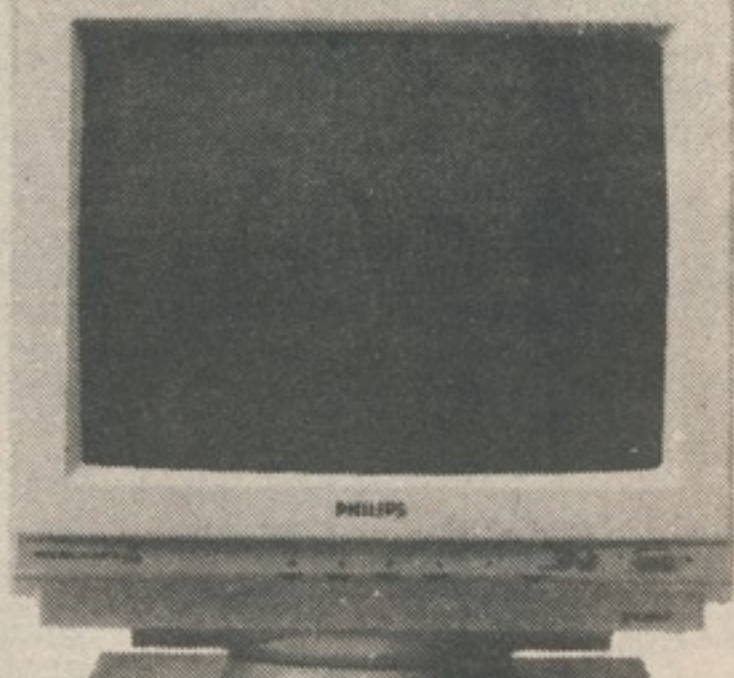


Now there is a simpler, faster and more effective method of upgrading your humble 520 ST to 1Mb RAM! Our new plug-in 512K memory upgrade unit offers excellent value for money, requiring no soldering or special technical know-how. (Not suitable for STE machines.)

ONLY £69.95 including VAT and delivery

SCOOP PURCHASE!

PHILIPS CM8852
PROFESSIONAL



Dont miss out on this exceptional opportunity to buy a top quality, dedicated Medium Resolution Monitor, made by Philips, one of the Industry's leading manufacturers!

14" Colour Medium Resolution Monitor ● Dark Glass screen for superb enhanced clarity & reduced glare ● SCART and RGB TTL sockets ● Single channel (mono) audio output ● Built-in Swivel-base stand

£219.00

inc VAT Delivery & cable

Please state either ST or AMIGA cable when ordering

HURRY WHILE STOCKS LAST!

ATARI

EVESHAM MICROS PRICE PROMISE - WE WILL BEAT ANY GENUINE ST COMPUTER OFFER ON A LIKE-FOR-LIKE BASIS

All our ST prices include mouse, user guide, etc. PLUS 5 disks of Public Domain software including paint program, wordprocessor, games, graphics & sound demos, desk accessories and utilities

520 STFM 'DISCOVERY PACK'

High quality, good value package based around the 520 STFM computer including 512K RAM, 1Mb Drive and built-in TV modulator. Also supplied is:

STOS Games Creator
Carrier Command
Space Harrier
FIRST BASIC
plus 'Discovering your Atari ST' Book

£269.99 inc.VAT and delivery
ONLY £299.99 WITH 1MB RAM FITTED

520 STE 'TURBO PACK'

Includes an Atari 520 STE with 1Mb Drive, joystick, plus a high quality selection of software including:

Indiana Jones & Last Crusade
Impossible Mission 2
Human Killing machine
Dragons Breath
Hyper Paint 2 (STE version)
Music Maker 2 (STE version)

Blood Money
Super Cycle
Out Run
Anarchy
FIRST BASIC
STOS

£359.99 inc.VAT and delivery
ONLY £389.99 WITH 1MB RAM FITTED
ONLY £439.99 WITH 2MB RAM FITTED
ONLY £519.99 WITH 4MB RAM FITTED

1040 STE 'EXTRAS PACK'

Superb starter package, consisting of a 1040 STE with an excellent selection of starter software. The package includes:

Kuma Wordprocessor
Kuma Spreadsheet
Kuma Database
Kuma Business Graphics

FIRST BASIC
Hyper Paint
'Prince' game
STAC Advent. creator

£449.99 inc.VAT and delivery
ONLY £529.99 WITH 2MB RAM FITTED
ONLY £609.99 WITH 4MB RAM FITTED

520STFM 1Mb Memory Upgrade Kit, requires soldering	£59.00
520STFM 1Mb Drive Upgrade kit with full fitting instructions	£54.95
SM124 Monochrome Hi-Res Monitor	£99.00

SC1224 Colour Monitor	£279.00
Philips CM8833 Mk.II 14" Colour Monitor including cable	£249.00
Monitor Switch Box - switch between colour/mono monitors ..	£13.95

TRUEMOUSE

(ST OR AMIGA)

WE GUARANTEE that this is the smoothest, most responsive and accurate replacement mouse you can buy for the ST or the Amiga. Excellent performance, amazing low price!

ONLY £17.95
(STATE MODEL WHEN ORDERING)

PHILIPS 15" FST TV/MONITOR

With its dedicated monitor input, this model combines the advantages of a high quality medium resolution colour monitor with the convenience of remote control Teletext TV - at an excellent low price!

£269.00
inc. VAT, delivery & cable



GOLDEN IMAGE HANDY SCANNER WITH TOUCH-UP (ST or AMIGA)

Top value package including 100-400dpi handy scanner with dither options. Scanner includes start/stop button, and viewing window with backlight. Either line-art or greyscaled images may be scanned at up to 400dpi. Also supplied is the amazingly powerful TOUCH-UP graphics package which drives the scanner directly as one of its many facilities. Requires 1Mb RAM Minimum.

ONLY £169.00
Including VAT/delivery

Evesham Micros

RETAIL SHOWROOMS

Unit 9 St. Richards Road
Evesham
Worcs WR11 6XJ
☎ 0386 - 765180
fax : 0386 - 765354
Open Mon - Sat, 9.00 - 5.30

5 Gisson Road
Cambridge CB1 2HA
☎ 0223 - 323898
fax : 0223 - 322883
Open Mon - Sat, 9.00 - 5.30
IBM Dealer ● Corporate Specialist

1762 Pershore Road
Cottbridge
Birmingham B30 3BH
☎ 021 - 458 4564
fax : 021-433 3825
Open Mon - Sat, 9.00 - 5.30

ALL PRICES INCLUDE VAT AND DELIVERY
Same day despatch whenever possible. Express Courier Delivery £5.00 extra.

MAIL ORDER DEPARTMENT

Unit 9 St Richards Road, Evesham, Worcs WR11 6XJ

Call us now on ☎ 0386-765500

Lines open Mon-Sat., 9.00 - 5.30.

Fax: 0386-765354

Technical support (open Mon-Fri, 9.30 - 5.30): 0386-40303

VISA

Send an Order with Cheque, Postal Order or ACCESS/VISA card details. Please allow 5 working days for Personal Cheque clearance.

Government, Education and PLC orders welcome
All products covered by 12 Months Warranty
All goods subject to availability, E. & O.E.

EXPRESS ON-LINE

Our comprehensive listing service this week features Bulletin Boards.

BLITTER BBS is back on-line 24 hours a day. The same atmosphere as before except there's now 1,000 files. Tel 0292 671638. Speeds 300-2400.

DARKSTAR BBS on-line from 7pm weekdays and 24 hours at weekends on 081 654 1032. Speeds 300-2400. 20 file areas. 20 sigs including Fidonet 20. On-line games featuring Skypix graphics for Amiga users, mouse-controlled menus and on-line sound.

DIRECT ACCESS BBS Speeds up to 2400 baud. IBM files, games, utilities, friendly sysop. 7pm to 8am seven days a week. Telephone 0935 79760.

EQUALISER BBS Online games 24 hours daily. V21/V22b/V23/. Amiga dedicated. 0232 454097.

SES DATABOARD V21/V22/V22bis. On-line 24 hours. Approx 10,000 files available. Games, utilities, C, graphics and more. Possibly the largest BBS in Kent. Tel: 0622 630240.

TERMINATOR - used to be called Paradise. Times: 6pm to 7am, 24 hours at weekends. Speeds: 300-2400. Amiga, ST, PC.

01 For Amiga 071-377 1358 V21/22/22b/23
061 Pc Support 061-443 1529 V21/22/22b/23
4/abc 0460 64511 V21
Above Board 0254 682862 HST
Absolute Zero Qbbs 081-741 7233 V21/22/22b/23
Advance Opus Hull 0482 28367 V21/22/22b/23
After Hours 0276 52096 V22/V22bis
Airtel 0342 717800 V21/22/22b
Aix-386 0905 52536 V21/22/22b/23
Aji Electronics 0452 309125 V21/22/23/V23v
Alan Solomon's Bb 0494 724946 V21/22/22b/23
Alchemist 0666 504597 V21/22/22b/23
Alternate Reality 0352 856626 V21/22/22b/23
Alternative Reality 0959 76695 V21/23/23v
Alternative V/data 081-761 8220 V21/23/23v
Almac PC Board 0324 665371 300-2400MNP5
0324 665460 HST
0324 665449 Hayes V 9600 V22/22b/23
Amiga Board 0268 510495 V22/22b/23
Amiga Connection 081-981 9289 V21/23
Amiga Shack 0737 361178 V21/22/22b/23
Amiga South-east 0293 28464 V21/22/22b/23
Amilink Bbs 021-778 5868 V21/22/22b/23
Amtech Support 0202 294716 V21/22/22b
Andromeda Galaxy 0243 379430 V21/22/22b/23
Apple Crackers 0268 781318 V21/22/23
0268 780724 V22/22b
Apricot Tech Sup 021-456 2402 V21/22/22b/23
021-456 2401 V21/22/22b
Arcport 0252 737065 V21/23
Arena 0625 539063 V21/22/22b/23
Argus Project 091-490 0327 V21/22/22b/23
Arkham Bbs 081-952 5128 V21/22/22b/23
Aspects 061-792 0260 V21/22/22b/23
ASTon-line 081-847 5389 V21/22/22b/23
Atavachron 0480 412884 V23v
Attic 081-308 0466 V22/22b
Auld Reekie 031-663 9924 V21/22/22b/23
Avalon Northeast 091-564 0009 V21/22/22b
Babble Bbs 0532 785964 V21/22/22b/23
Babbs Tower 0394 276306 V21/22/22b/23
Banat Board 081-783 1151 V21/22/22b/23
Bar 0904 642560 V21/23/23v
Barnabas 0708 852526 HST
Barney's Rubble 021-441 1801 V21/22/22b/23
Basingstoke Opus 0256 728331 V21/22/22b/23
Bath BBS 0225 83584 1/840060
Bath BBS 0225 840060 V21/22/23/V22bis

Bay BB 0227 741528 V22 Bis/MNP5
Bbs09 0705 736025 HST
Bbz 081-663 3732 V21/22/22b/23
Beeb-tec 0472 276476 V23v
Betelgeuse 5 0463 231339 V21/22/22b/23
Beyond Belief 0642 787898 V21/23
Bexhill Com Centre 0424 224417 V21/22/22b/23/V23

Big Bang Burger 081-420 6356 V21/22/22b/23
Bike Shop 0705 827764 V22/22b
Bixbox 0634 200931 V21/22/22b/23
Blackpool College 0253 57941 V21/22/22b/23
Blind'n Bbs 01 764-0954 V21/23
Blitter 0292 671638 HST

Body Matters 071-603 7581 V21/22/22b/23
Boggin 0532 483563 V23/23v
Boog Bb 0252 626233 V21/22/22b/23
Boroughbridge Q 0423 324532 V21/22/22b/23
Bradford Bb 0274 480452 V21/23/23v
Braindead Opus 0823 254352 V21/22/22b/23
Breakthrough 051-734 5817 V21/22/22b/23
Brown Bag 071-404 0897 V21/22/22b
Brunel Bbs 0272 584352 V21/22/23
Buz Board 081-202 9175 V21/22/22b
Buzby's Grapevine 041-762 2000 HST
Byte Back! 081-959 8105 V23
Cargo BBS 0420 475462 V21/22/22bis
Campus Ros 0223 357445 V21/22/22b/23
Castle Bbs 0276 691872 V21/22/22b/23
Cats Board 0628 824852 HST
Catweazle 081-428 9476 V21/22/22b
CCi4 0482 655798 V23/23v
Central Bbs 021-711 1451 V21/22/22b/23
Chase Wildcat U.g. 0543 871562 V21/22/22b/23
Chequers 0622 891308 V21/23
Chiba City 0501 44262 V21/22/22b/23
Chipboard 0532 320225 V21/23/23v
Chronos' Lair 021-744 5561 V21/22/22b/23
Cix 081-399 5252 V21/22/22b/23
Clapham Junction 0234 64261 V21/22/22b/23
Cliff's Corner 0502 518274 V21/22/22b/23
Club 1512 081-204 8755 HST
Co-op Board 081-316 6488 V21/22/22b/23
Co-op Board (crs) 081-832 1961 V21/22/22b/23
Co-op Board (nicc) 0509 826339 V21/22/22b/23
Co-op B'Mouth 0202 532701 V22/22b
Co-op P'Mouth 0705 754851 V21/23
Codeomatic Bbs 0472 250690 V21/22/22b/23
Communitel Demo 081-968 7402 V23v
Compass!! 0942 896661 V21/22/22b
C'center Opus 071-928 2005 V21/22/22b
Computers 4 Christ 0926 428294 V21/22/22b/23
Connection 071-978 8540 V21/23/23v
Connections 081-903 1309 V21/23/23v
Connex 071-431 3922 HST
Consett Forum 0207 506179 HST
Corby Town Opus 0536 205113 V21/22/22b/23
Cornwall Gate Opus 0752 848806 V21/23

Cp/m User Group 0753 868196 V21/22/22b/23
Critical Mass Bbs 0727 56939 V23/23v
Crown Green 071-245 1512 V21/22/22b/23
Crystal Tower 081-886 2813 V21/22/22b/23
Cure 0604 27865 V22/22b
Cv Database Bb 0427 810211 V22/22b
Cyberspace Amiga 0295 275045 V21/V22/V22bis
0492 49194 V21/23
Cymrutel 081-346 2816 V23v
Cynotel 061-434 9907 V21/22/22b/23
D.I.e. 0203 333195 V21
Dambusters 081-207 2989 HST
Dark Crystal 0392 434477 HST
Dark Halo 0446 33729 V21
Dark Side 0604 413716 V21/22/22b/23
Darkhaven 081-478 5464 V21/22/22b/23
Data Network 0245 323693 HST/V32/V22bis/V22/V23
Datnet 081-680 5330 V21
Dataset/wanderland 081-680 5330 V21
Datatrade Qbbs 0460 54615 V21/22/22b/23
Dbase User Group 0532 842213 V21/22/22b
Dce Board 0296 88165 V21/22/22b
Dcs 081-879 7578 V21/22/22b
Deep Thought 0634 683696 HST/V32
Desert 0244 550332 V21/22/22b/23
Desert BBS 0604 758126 V21/22/22b/23
Diamond Opus 0791 86504 HST/V32
Diggertel #1 0925 411265 V21/22/22b/23
Digital Matrix 021-705 5187 V21/22/22b/23
Direct-line 1 081-841 1847 V21/22/22b/23
Direct-line 2 081-842 2030 V21/22/22b
Domain Bbs 081-773 2422 V22/22b
Dragon's Tower 081-202 0709 V21/22/22b
Dunedin Blackhole 031-669 2974 V23v
Dwarfen Realm 0376 501036 V21/23/23v
Ebbs-1 0274 541156 V21/23/23v
Eddie's Bbs 0635 71324 V21/22/22b/23
Edinburgh Castle 031 334 7043 HST
Empirical Research 0543675158 V21/22/22b/23
Empyryon 0792 580781 V21/22/22b/23
End To End 0376 84644 V21/22/22b/23
End Zone 0524 752245 V21/22/22b/23
Engineers Workbnch 051-327 7036 V21/22/22b
0603 250689 V23/23v

Eureka Gateways 081-683 0629 V21/22/22b/23
Eureka li 0767 5051 V21/22/22b/23
Exchange S/w 0525 715789 V21/22/22b/23
Eye-2 0736 794827 V21/23
Fal Opus 081-527 4165 V21/22/22b/23
Falcon Bbs 0480 812097 V22b
Family Skeletons 0954 210692 V23v
Fen Tiger 0734 713909 V22/22b
Fido Uk1 0273 513872 V23v
Firm 081-759 1957 V22/22b
Flight Path 0905 795002 V22/22b
Focus International 0905 795002 V22/22b

Focus Tbs 0303 42690 Hst
Focus Uk 0905 774477 V21/22/22b/23
Forth View 031-660 3474 V21/22/22b/23
Forum-80 Hull 0482 859169 V21
Fox's Den 0689 27085 V21/22/22b/23
Free Net One 0767 51972 V21/22/22b/23
Freelance Lynx 0480 406261 V21/22/22b/23
Friday The 13th 0642 224833 V21/22/22b/23
Fuzzy Logic 0634 200707 V21/22/22b
Gabbys 0705 524805 V21/22/22b/23
Gallery Qbbs 081-847 2795 V21/22/22b
Game Over 0752 848070 V21/22/22b/23
Games Online 0273 699200 V21/22/22b/23
Gaslamp 0706 358331 V21/22/22b
Gaugonzola Bbs 0453 511112 V21/22/22b
Gnome At Home 081-888 8894 V23v
Gods 081-994 9119 V21/23
Golly! 0734 320812 V21/22/22b/23
Goobtel 0602 706307 V21/23
Good Life 081-541 0187 HST
Gopherit's Box 061-320-3208 V21/22/23
Gourmet 0474 536654 V21/22/22b
Grainstore 0905 770198 V21/22/22b
Grenadier 0825 762803 V21/22/22b
Hacker's Delight 0702 523853 V21/22/23
Halfwits Bbs 0272 340310 V22/22b
Hamnet 0482 465150 V21
Harlequin 061-945 3612 V21/22/22b/23
Hastings Bbs 0424 717919 V21/22/22b/23
Hawk's Castle 0344 411621 HST
Hazzard Bb 071-737 0505 V21/22/22b/23
Health-data 081-986 4360 V23v
Heartbeat 0734 352032 V21/23
Hilary's Board 0277 233468 V21/23
Humor Opus 0579 70347 V21/22/22b
Humber Bridge 0482 850785 V21/22/23
Ichthus (trinity 3) 0734 461466 V21/22/22b/23
0903 700771 V21/22/22b/23
0227 770403 V21/22/22b
0895 72021 V21/V22/V22
0832 73003 V23v
071-704 0760 HST
071-226 1248 V21/22/22b/23
0254 59352 V21/23/23v
0534 37779 V21/22/22b/23
0534 39389 V21/22/22b/23
031-225 5368 V21/22/22b/23
0754 67796 V21/22/22b/23
081-742 1640 V21/22/22b/23
0324 32414 V21/23
0705 258694 HST
0608 83458 HST
0472 347882 V21/22/22b/23
0209 821670 V21/22/22b/23
0908 668398 HST
081-676 0072 V23v
0865 56703 V21/22/22b
0233 620228 V21/22/23
0484 665415 V21/22/22b/23
Kleopatra's Pyramid 0602 384281 V21/23/23v
0844 274066 V21/22/22b/23
081-673 7294 V21/22/22b/23
051-724 4458 V21/23
0705 811531 V21/22/22b/23
0532 438430 V21/22/22b
081-751 6096 V23v
0202 485723 V21/22/22b/23
0580 212043 V23v
0522 511277 V21/22/22b/23
0633 279985 V21/22/22b/23
051-428 8924 V21/22/22b/23
051-931 4271 V21/22/23
0389 55762 V22/V22bis
0442 230461 V21/22/22b/23
0772 623167 300-2400
0434 606639 V21/22/22b/23
081-455 6607 V21/22/22b/23
081-468 7648 V21/23/23v
081-667 1313 V21/22/22b/23
081-366 1778 HST
081-748 0974 HST/V32
081-534 1200 V21/22/22b/23
081-519 1055 V21/22/22b/23
0703 787489 V21/23
021-444 8972 V21/22/22b/23
0242 260 685 V21/22/22bis
0602 455444 V21/22/22b/23
081-543 8017 V21/22/22b/23
0473 610139 V21/22/22b/23
0603 300947 V21/22/22b/23
021-430 3761 V21/22/22b/23
0361 83641 V21/22/22b
0274 547006 V21/22/22b/23
0376 24402 V23v
0980 863031 V21/22/22b/23
081-346 7150 V21/23/23v

Index Linked
Infocomm UK
BIS.Intel Ace
Islington Bbs
Jabulon Bb
Jersey Bbs
Jersey Opus
Jocks Away!
Jolly Fisherman
Jolly Roger
Jusavo
Just The Place
K-wood
Kashmir's Bbs
Kernow Bb
Key-board
Keydata
Kidlington Bbs
King Of The Castle
Kirklees Opus
Kleopatra's Pyramid
Komputer Knidge
Kybernesis
Labyrinth
Lampight Qbbs
Laser Tbs
Lau's Qi Bb
Lightfinger's Place
Linelight
Linx Bbs
Liquorice Allsorts
Liverpool Mailbox
Liverpool Ros
Loch lomond
Loft
Logical BBS
Log On In Tynedale
London Bb
London City Mag
London Connexion
London Embassy
London Guest Hse
London Mail Centre
London Metropolis
Loony Bin
Mabbs
Mach II Bbs
Mactel Hq (grn Box)
Mactel Metro
Mactel Phoenix
Madness Bbs
Magic Castle Bbs
Magic Mushroom
Magnum
Magrathea
Manor
Marcel

0602 384281 V21/23/23v
0844 274066 V21/22/22b/23
081-673 7294 V21/22/22b/23
051-724 4458 V21/23
0705 811531 V21/22/22b/23
0532 438430 V21/22/22b
081-751 6096 V23v
0202 485723 V21/22/22b/23
0580 212043 V23v
0522 511277 V21/22/22b/23
0633 279985 V21/22/22b/23
051-428 8924 V21/22/22b/23
051-931 4271 V21/22/23
0389 55762 V22/V22bis
0442 230461 V21/22/22b/23
0772 623167 300-2400
0434 606639 V21/22/22b/23
081-455 6607 V21/22/22b/23
081-468 7648 V21/23/23v
081-667 1313 V21/22/22b/23
081-366 1778 HST
081-748 0974 HST/V32
081-534 1200 V21/22/22b/23
081-519 1055 V21/22/22b/23
0703 787489 V21/23
021-444 8972 V21/22/22b/23
0242 260 685 V21/22/22bis
0602 455444 V21/22/22b/23
081-543 8017 V21/22/22b/23
0473 610139 V21/22/22b/23
0603 300947 V21/22/22b/23
021-430 3761 V21/22/22b/23
0361 83641 V21/22/22b
0274 547006 V21/22/22b/23
0376 24402 V23v
0980 863031 V21/22/22b/23
081-346 7150 V21/23/23v

Matrix 051-255 0225 V21/22/22b/23
Mbbs Leconfield 0964 550745 V21/22/22b/23
Mbbs Mitcham lic 081-648 0018 V21/23
Medway 0634 280031 V21/22/22b
Mektronik Cnsntnts 061-773 7739 V21/22/22b/23
Mercianet 0203 611943 V23v
Merkinstead 061-434 7059 V21/22/22b/23
Merlin 0443 834179 V21/22/22b/23
Mgbbs 0443 733343 V21/23S
Micro Live Bb 081-567 6500 V21
Micro Update 081-877 1529 V21/22/22b/23
Microdeal 0726 65422 V21/22/22b/23
Microlog 0422 71921 V21/22/22b/23
Microview! 081-509 0729 V23v
Midget Gem 0748 834836 V21/23
Midnight Caller 0633 279243 V21/22/22b/23
Mind Boggles 0362 762868 V21/22/22b/23
Mininet 3 0642 672813 V21/22/22b/23
Miracom Support 0473 232540 HST
Mirage 061-652 1242 V21/22/22b/23
Mirror li 0628 810889 V21/22/22b/23
Mirrorworld/quest 1 0883 844044 V23
Mission Impossible 0602 654329 HST
Mk Board 0908 671289 V21/22/22b/23
Mkbbs 0908 504556 V22/22b
Monkey Tree 0952 677002 V21/22/23
Monusci 0293 545665 V21/22/22b/23
Motor Exchange 0484 435314 V21/22/22b
Multi-bbs 041-649 9043 V21/22/22b/23
Murdoch's Hangout 021-711 2620 V22/22b
Murky Caverns 081-426 9386 HST
Mwcle 0926 421844 V22bis
My Little Phoney 0865 773277 V32/HST
Nice Mid-west 0341 250377 V21/22/23
Nite Life 071-976 6807 V21/22/22b
No Escort Required 081-200 3817 HST
No.1 Bbs 081-958 1689 V21/22/22b
Noah BBS 0272 572322 300-2400
Norpac 0434 608324 V21/22/22b
North Wales Bb 0978 88372 V21/22/22b
North Yorks Qbbs 0423 868065 V22/22b?
Northern Lights 0768 773685 V22/22b
Norwich Onion Bbs 0603 423305 V21/22/22b/23
Nova 0455 553371 V21/22/22b
Nova-net 0274 370760 V22
Odd-ball 081-679 2583 V21/22/22b/23
Open Access 081-427 3974 V21/22/22b/23
Optix 0482 872294 V21/22/22b/23
Organic Garden 081-464 3305 V21/22/22b/23
Out Of The Blue 081-668 7667 V21/22/23
Owl Service 0532 605876 V21/23
PS & Q'S Tel 051-236 3105 V21/22/22b/23
Pacific Lightning 0732 845338 V22/22b
Packet Bbs 081-547 1479 V21/22/2
Packet Place 0484 435620 V21/22/22b
Palm Beach 0303 265979 V21/22/22b/23
Pazazz Viewdata 0383 620259 V23v
PC Access 071-608 0081 V21/22/22b/23
PC-Amiga Link 04023 84914 up to 2400
PC Forum 0322 335348 V21/22/22b/23
PC Serve Shop 081-864 2633 V21/22/22b/23
PC Serve Softnet 0895 420164 V21/22/22b/23
PC Serve Storehouse 0494 728094 V21/22/22b/23
081-800-3549 V21/22/22b/23
0602 735119 V22/22b
0895 448998 V23v

Pc-vax Opus 081-800-3549 V21/22/22b/23
Pcamiga Bbs 0602 735119 V22/22b
Peacenet West 0895 448998 V23v
Pecan Software BBS 0272 248076 V21/22/22b
0943 830820 V21/22/22b/23
0226 340425 V21w/V22v/23
0249 817704 HST
0424 853361 V21/22/22b/23
021-472 0256 V21/22/22b/23
0559 322766 V21/22/22b/23
0476 62450 V21/22/22b/23
071-580 1690 V21/22/22b/23
081-391 5779 V21/22/22b/23
0698 423669 V21/22/22b/23
0533 880114 V21/22/22b/23
0772 612462 V23v
0384 401770 V21/22/22b/23
081-300 7177 V23v
0793 480028 V21/22/22b/23
091-261 5228 V21/22/22b/23
0232 645942 V21/22/22b
071-239 0871 V21/22/22b
0895 59071 V21/22/22b
0846 693067 V21/22/22b
0582 414991 V21/22/22b/23
0703 685527 V21/22/22b/23
0542 33050 V21/22/23
0555 851887 V21/22/22b/23
0602 640488 V21/22/22b/23
0865 796431 V21/22/22b/23
061-483 4105 V21/22/22b/23
0292 45345 HST

Penguin 0943 830820 V21/22/22b/23
Phantom 0226 340425 V21w/V22v/23
Phoenix 0249 817704 HST
Piston Popper 0424 853361 V21/22/22b/23
Plug-ole 021-472 0256 V21/22/22b/23
Plus And Minus 0559 322766 V21/22/22b/23
Poacher 0476 62450 V21/22/22b/23
Polymer Bb 071-580 1690 V21/22/22b/23
Port Of Call 081-391 5779 V21/22/22b/23
Power Play Qbbs 0698 423669 V21/22/22b/23
Power Tower 0533 880114 V21/22/22b/23
Prestonet 0772 612462 V23v
Project Bbs 0384 401770 V21/22/22b/23
Prometheus 081-300 7177 V23v
Proximity 0793 480028 V21/22/22b/23
Publishing Shop 091-261 5228 V21/22/22b/23
Purely Pc 0232 645942 V21/22/22b
Pyramid 071-239 0871 V21/22/22b
Pyroto Mountain 0895 59071 V21/22/22b
Quasar 0846 693067 V21/22/22b
Really Interesting 0582 414991 V21/22/22b/23
Reflex Bbs 0703 685527 V21/22/22b/23
Regency Bbs 0542 33050 V21/22/23
Remotelpow 0555 851887 V21/22/22b/23
Rivendell 0602 640488 V21/22/22b/23
Rm Tech. Support 0865 796431 V21/22/22b/23

UNIVERSAL OVERNIGHT DISTRIBUTION LTD

TEL: 0228 512131 (24 Hour order line)

Personal
Callers
Welcome

Fax: 514484

Unit 26, Enterprise Centre, James Street, Carlisle, Cumbria, CA2 5BB

HIGH SPECIFICATION 3.5" DISKS

	Our Brand	SONY
50 DSDD.....	42p each.....	49p
100 DSDD.....	36p each.....	43p
250 DSDD.....	34p each.....	41p
500 DSDD.....	33p each.....	40p

Individually wrapped, 100% certified and guaranteed 3.5" DSDD 135tpi disks with labels.

3.5" DISKS WITH BOXES

25 Disks with 50 cap box:	£15.95
35 Disks with 100 cap box:	£19.95
45 Disks with 100 cap box:	£24.95
55 Disks with 100 cap box:	£28.55
80 Disks with 100 cap box:	£38.95
160 Disks with 2x100 cap boxes:	£68.95
240 Disks with 3x100 cap boxes:	£122.95

Our claim: We are probably the cheapest disk and accessory supplier in this magazine!

Individually wrapped 100% guaranteed DSDD disks

Remember - Prices INCLUDE VAT AND POSTAGE

**DON'T RISK STORING DATA ON
OTHER TYPES OF DISKS -
OURS ARE INDIVIDUALLY
WRAPPED, 100% CERTIFIED AND
GUARANTEED ERROR FREE**

WHY BUY DISKS FROM US?

1. All disks exceed ANSI standards.
2. We supply shops, PD libraries and educational establishments on a regular basis.

DISK BOXES

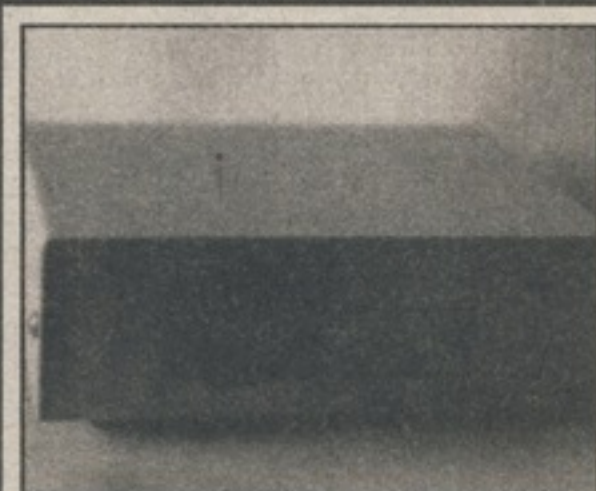


Lockable high quality disk boxes at unbeatable prices:

Qty:	1+	3+	6+
50 cap	£4.99	£4.25	£3.99
100 cap	£5.99	£5.25	£4.99

12 capacity library cases...Five for £4.75

DATA SWITCH BOXES



Our quality switch boxes use only the BEST connections:

1:2 parallel type.....	£15.95
1:2 serial type	£14.95

High tech. rotary controls

ACCESSORIES



Mouse Mat:	£2.99
Mouse House:	£1.99
3.5" Cleaning Kit:.....	£2.95
5.25" Cleaning Kit:.....	£2.95
IBM or AMIGA parallel printer cable:	£7.95
Universal plastic printer stands	£6.95
Extra disk labels (3.5") per 100	£0.95

5.25" GUARANTEED DSDD DISKS

100% certified and error free 5.25" DSDD disks, individually sleeved, complete with labels etc.

25 disks with 50 cap box	£14.50
50 disks with 100 cap box	£19.95
75 disks with 100 cap box	£24.95
100 disks with 100 cap box	£29.95

50 5.25" disks	£14.95
100 5.25" disks	£26.50

500 5.25" disks	£121.00
1000 5.25" disks	£233.00

Additional 100 capacity disk boxes

ALL PRICES INCLUDE VAT AND POSTAGE!!

To order via telephone simply quote credit card number and expiry date

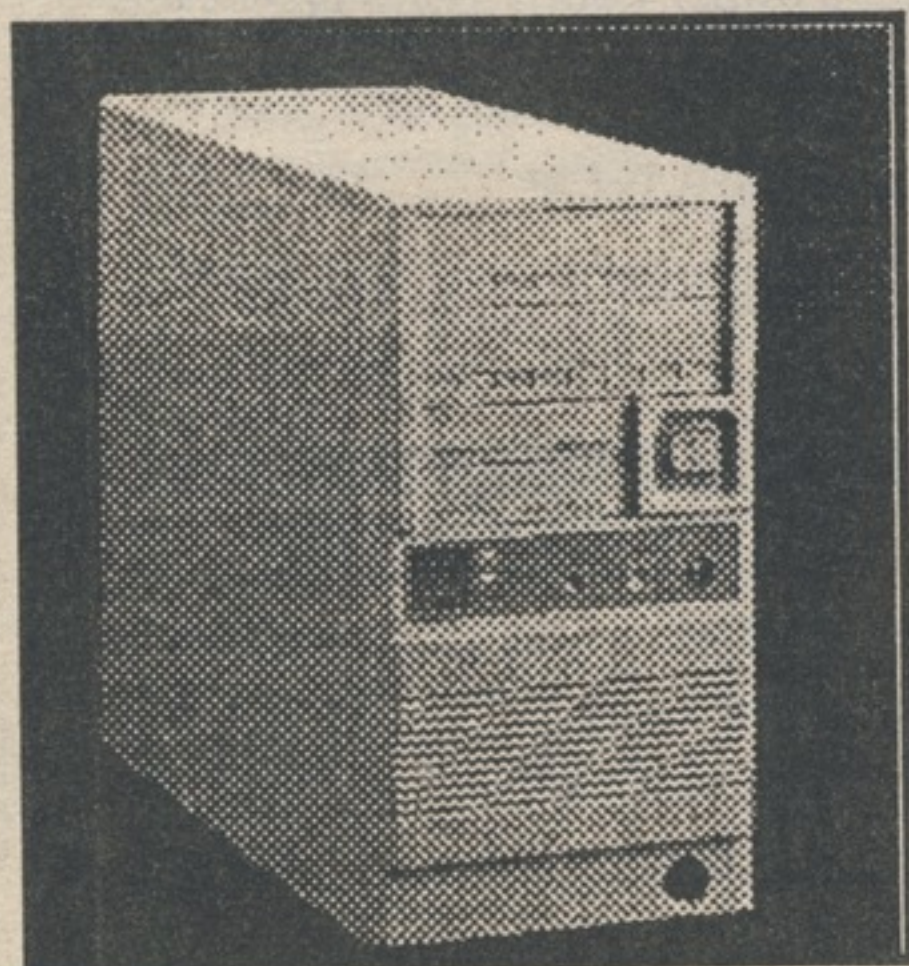
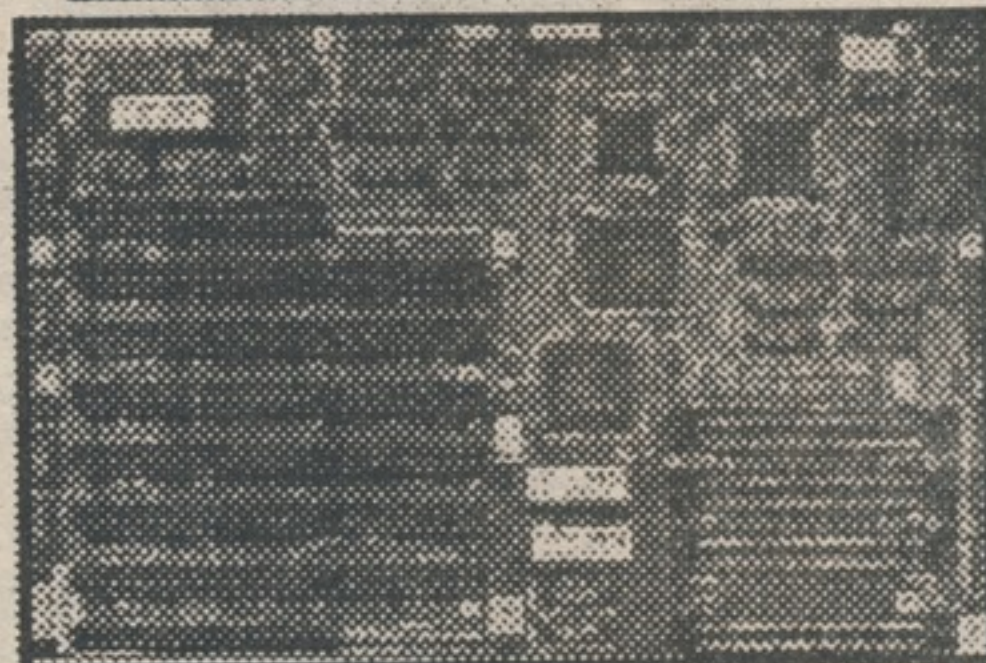
To order via mail make cheque or PO payable to: UNIVERSAL OVERNIGHT DISTRIBUTION LTD

Trade customers, call for spot prices. Bulk buyers - we have great prices.
Overnight courier (get your goods tomorrow!) **£7.99**. Please note Min order value is : £10

Breaking The Price Barrier



WE PROVIDE NOT
ONLY A CASE
BUT ALSO A
MASTERPIECE



MI-BM 80286-12
ONLY £ 699.00

MI-BM 80286-16
ONLY £ 799.00

MI-BM 80386SX
ONLY £ 899.00

MI-BM 80386-25
ONLY £ 1099.00

MI-BM 80386-33
ONLY £ 1399.00

MI-BM 80486-25
ONLY £ 1999.00

386SX-16 LAPTOP
ONLY £ 1495.00

COMPLETE SYSTEMS

Including 1Mb RAM, 1.44Mb 3.5" FDD
40Mb AT HDD, FDD/HDD IDE controller
2 Serial/ 1 Parallel/ 1 games, VGA 16 bit 256Kb
Display Card, 14" MONO VGA Monitor
101 Key Keyboard, Smart Mini Tower Case
FREE One Year On Site Maintenance

NOTE:-THE PRICE PRINTED DO NOT INCLUDE DELIVERY & VAT, AND ARE FOR CASH WITH ORDER. ABOVE PRICE & SPECIFICATION IS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE.

OPTIONS

SUPER VGA COLOUR MONITOR ADD £ 100.00
1024 X 768 1MB VGA CARD ADD £ 50.00
80 MB HARD DRIVE ADD £ 150.00
130 MB HARD DRIVE ADD £ 199.00
120 MB TAPE STREAMER ADD £ 249.00
1.2 MB 5.25" FLOPPY DRIVE ADD £ 49.00
1 MB EXTRA RAM ADD £ 49.00
DOS 4.01 ADD £ 49.00, WINDOWS 3 ADD £ 75.00

**WE STOCK A FULL RANGE
OF!**

MOTHER BOARDS, ADD ON CARDS
HARD AND FLOPPY DISK DRIVES
MEMORY UPGRADES, MONITORS
PRINTERS AND PRINTER CABLES
DATA SWITCHES, GENDER CHANGERS
COMPUTER CASES & ACCESSORIES

Phone Now For Full Price List & Add-On Options



Supertech (UK) Ltd



East Street, Bury, Lancs, BL9 0RU Tel:(061) 762 9666 Fax:(061) 762 9526

Tim Smith's

Write to 30 Monmouth Street, Bath BA1 2BW (in the Envelope)

CENTREFOLD

OPENING TIME



Er... Centrefold. Let's just call it Centre for the moment and forget that it's a page floating around somewhere in the middleish of the mag.

I think it had something to do with mentioning the PCW a few weeks ago in such glowing terms. Still we can't moan really can we, a page of compact rib ticklingness (or at least a page of you - Sub) will suffice - it's not the quantity, it's the quality that counts. Frankly I work on the principle that computing is making everything in the world smaller by the minute, supercomputers in the hand, colour screens the size of matchboxes. And being only four feet three myself this is a trend which I find admirable.

Anyway, what's been happening this week. Future Publishing has announced some more magazine launches, recession? We dismiss it. So everyone here as been down at the local bistro L'Expensive Vache, celebrating. Antoine Le Monde de Canard, the owner of said restaurant, has a great line in artistic erotica, a delicious chocolate cream pie and an Archimedes which seems to run Zarch non-stop.

PLAYING FOR KEEPS

We talked of a software house last week, which for purposes of not getting slapped round the inside of the thigh with a wet fish, I did not name. This week there's a much more pleasant story...

Did you see the Super Bowl? I think it consisted of two teams of huge American lads with shoulder pads (you mean that's not their real shape? - sub) called the Sexy Sioux and the New Yorkshire Big Chappies hammered hell out of each other for a few hours.

Anyway, a couple of hacks from sister magazines went up to Electronic Arts in order to play them at John Madden Football on the Megadrive. Guess who won? We did! Normally I wouldn't class myself along with the other hacks, but everyone loves a winner.

THE GEEK



This week.... he got beaten up by his brother's hard disk

FACTS ALOT

One of the strangest phrases ever to crop up in programming was the Crippled Leap Frog Test. The only thing anyone knows about it is that it is a variation on the Leap Frog Test.

The Bell 103 low speed modem standard is the most widely used in the United States

Channel Four's Manageress never actually turns her PCW on.

LETTER SPRAY

This week you can see Tim Smith being roundly abused by a range of irate readers who disagree about his views on nearly everything.

Dear Tim,
Why are you always going on about machines which you don't actually own? It's all very well trying to be funny, and I say trying because more than often as not (! - TS) you're not, but why also try to make people think that you're something which you are not? Just get on with the humour if you can and stop the bragging.

Yours, Robert Dawson,
Calcott, Berks

Dear Robert,
How do you know that I don't have

these machines then, eh? You don't do you? You're presuming aren't you? Well stop presuming and I might stop bragging.

Dear Tim,
Please stop these bloody stupid Sunday Sport type stories you little *****

Yours, Anon

Dear Anon,
As you will be aware I had to cut this letter massively because of the foul and abusive language therein.

To use an oft quoted phrase from Shakespeare's immortal Othello, when Iago turns upon a jealous Othello and says: "It's not clever nor grown up to swear."

Dear Mr Smith,
Thanks for the Geek, he's really quite good, grovel, grovel.
Yours, Susan Davidson, Aberdeen

Dear Sue,
What, no abuse? The readers will be upset

A CENTREFOLD EXCLUSIVE

TANDON 286 CONTROLS WORLD BANKING SYSTEM

It can be exclusively revealed that a stand alone Tandon laptop is the core system behind the little known Conspiritorial Masons, P2, G7, Triad, Tom-Tom Macoute, Tong World Banking Cartel and Social Club.

The CMBC are known to:

- Eat babies
- Plant viruses for fun
- Enjoy the way Wimbledon play
- Not back-up data
- Run the economies of most western countries

The CMBC as it is known has been underpinning western finances for some 25 years without anyone knowing. A reliable source, Mr Charlie

FACTS ALOT

The APL (A Programming Language) er... programming language was developed at Harvard and IBM between 1956 and 1967. The ubiquitous Ken Iverson was one of the people behind it.

LISP (List Processing) was invented by John McCarthy at MIT in 1957.

Gingridge of 14 Halpern Halls, Brislington, who wishes to remain nameless for obvious reasons, but asked too damn much for the story, told a Centrefold reporter that until December 1990 the CMBC had run the business from a CPC464. They only upgraded when their pirated versions of *Protext* and *SuperCalc 2* corrupted: "They had made no back-ups", slurred Gingridge over a blatantly tapped telephone line from his secret hideout at 11b Sauté Street, Sutton Coldfield, "and they were all very angry about it. They decided on the Tandon because the Grand Aardvark himself received the machine with software for Christmas."

During the period of changeover five countries applied for receivership, three states put all their money in plastic carrier bags and left for Australia, and Great Britain applied to the Nat West for a £200,000,000,000 personal loan over 18 months.

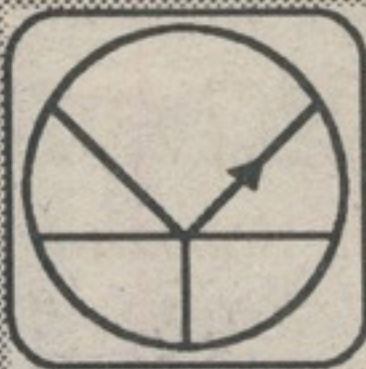
A spokesGrandMoose for the CMBC denied the existence of the organisation when we spoke with him: "Never heard of them. What is this Beadle's About or something? I'm just a fishmonger." When our reporter explained that he had one trouser leg rolled up and his left arm through his legs, the spokesGrandMoose was more



• A stoney faced spokesperson for the CMBC.

forthcoming: "Gaw blimey old chap yes, the CMBC have been going for years. The Stock Exchange Crash, that was us after an office party. The Great Depression, that was us after another office party. We love a good laugh. Of course we have other computers, we use a Cray to work out the holiday roster and an Amiga to play *Kick Off*, but apart from that we're not really into high-tech. You're not going to print this are you?"

Cadbroke Computing International



**12 Months On Site Warranty,
featuring 24 hour response time
is available as an option on all
ST's for just £29.99 extra.**

Please Read: Terms of Sale.

We are the longest established Atari dealer in the U.K. We have developed an extensive customer service policy which means that we test all Hardware/Software prior to despatch to ensure that goods arrive in working order. Although our prices are not always the cheapest we do endeavour to offer consistently good service and backup. This isn't just our opinion, we were voted "Best Dealer 1989" by the readers of ST World magazine, not for "the number of boxes shifted", but for quality service.

On Site Warranty: We have recently changed our backup programme by offering 12 months on site warranty as an extra with all ST's therefore giving the customer a wider range of options. We already offer on site warranty on all Star printers and Philips monitors listed at no extra charge.

All prices are correct at copy date 17/01/91, and are subject to change without prior notice. All prices are accurate while stocks last. Phone for up to date prices. All prices include VAT, there are no hidden extras (WYSWYG). Delivery (in Mainland U.K) is free, on orders over £100 (add £10 for next day courier delivery. All prices available on Mail Order Shop prices may differ.

Atari Packs

520STFM Discovery Pack	£ 279.99
520STE Turbo Pack	£ 369.99
1Mb STE Turbo Pack	£ 399.99
2Mb STE Turbo Pack	£ 474.99
4Mb STE Turbo Pack	£ 549.99
Plus pack: ten games, J/stick, Dustcover	£ 30
Lynx + California games	£ 129.99
Portfolio pocket PC	£ 199.99

Amiga Packs

A500 Batman Pack	£369.99
A500 Screen Gems	£369.99
Plus pack	£30
Includes Tenstar, Photon paint II, joystick, mouse mat	

Service Centre

Diagnostic service £15

Our Engineers can repair ST's and Amiga's in minimum time at competitive rates. We also offer a diagnostic service for which the customer is given a quote for the total cost of repairing the machine.

ROM switch + TOS 1.4 £49.99

This switch allows two sets of ST ROM's to be fitted to an ST and switched between to ensure compatibility with all software. Machines must have TOS 1.09 in two ROM form. If six sockets are fitted, no soldering is required. TOS 1.4 (2 ROM's) and two extra sockets are supplied.

Exchange ST PSU's £59.99

We can offer fully compatible PSU's for ST's at this price in exchange for the damaged PSU. Our engineers can fit any STFM memory upgrades for £20. We can also fit SIMM's, TOS, Blitter chips, PSU's for just £10. Phone for details.

Star Printers

Star LC-200	Star LC24-200	Star LC24-200 Colour
£219.99	£249.99	£319.99
7 Colour printer	24 Pin printer	24 Pin printer
Colour + mono ribbon supplied	222 cps	222 cps
225 cps	5 Resident LQ fonts	5 Resident LQ fonts
5 Resident NLQ fonts	Accepts font cartridges	Accepts font cartridges
Bottom feed	Bottom feed	Bottom feed
Push or pull tractor feed	Push or pull tractor feed	Push or pull tractor feed
Paper parking	Paper parking	Paper parking
Star LC24/10	£209.99	All Star Printers carry 12 months on site
Star Laser 8DB, 2Mb RAM	£1899.99	warranty (Mainland UK). All printers include
Star LC-10	£169.99	IBM Centronics cable. Phone for ribbons,
Star LC-10 Mk II	£189.99	paper and printer stands.
Citizen Swift 24 pin	£319.99	64K buffer 3 input switch £79.99
Citizen 120D+	£139.99	256K buffer 3 input switch £149.99

Monitors

Atari SM124 Hi-res Mono monitor	£ 109.99
Philips 8833 MK II Colour, Stereo monitor	£ 249.99
Cmdr 1084S Colour monitor * limited offer *	£ 269.99
Philips 15" FST TV	£ 269.99

The Philips 15" FST TV includes: remote control, Scart input, 60 tuner presets, sleep timer and Fastext. All displays include Scart cable. Deduct £10 from Monitors only, if bought with computer. The Philips 8833 comes with full 12 months on site warranty.

Trust PC's

AT 12Mhz Desktop	£449.99
AT 12Mhz VGA Mini tower 40Mb	£799.99
AT 16Mhz Desktop	£499.99
AT 16Mhz VGA Mini tower 40Mb	£849.99
386SX Mini tower	£699.99
386SX VGA Big tower CK66 40Mb	£1099.99
386SX-20 VGA Mini tower 40Mb	£1129.99
386-25 VGA Mini tower	£1194.50
386-25 VGA Big tower CK66 40Mb	£1599.99
386-33 VGA Big tower CK590 40Mb	£1699.99
486-25 VGA Big tower CK590 210Mb	£POA
Mono Monitor	£99.99
VGA Colour Monitor	£299.99

PC Emulators

PC Speed, XT Emulator	£99.99
AT Speed, AT Emulator	£199.99
ATOnce, AT Emulator	£199.99

Midistudio Master

- 100 tracks storage, 20 tracks playing simultaneously.
- 240 ppq resolution.
- Realtime mix-down via mouse.
- Realtime scrolling arrange window.
- 11 levels of quantise, including humanise.
- Pipeline/Module system.
- Loop record.
- Midi soft keys.
- Works on 1040STF(M)(E)

**Master
£129.99**

**Midistudio
£49.99**

Midistudio is a 20 track sequencer which can operate on a 520STFME, in medium res. Midistudio is an easy to use, low cost introduction to Midi music composition.

ST FAX/Modem

Now you can use your ST to send faxes. Uses a fully featured modem so you can also access Bulletin boards and commercial communication systems.

- Fully Hayes compatible modem
- Auto dial/ Auto answer
- 300/1200/2400 Baud
- Mix text and graphics.
- Cannot receive faxes.

£200

Software Sale

**Up to 35% off ST, Amiga
and Atari 8 Bit titles
Phone for details**



Low cost Hard Drives

We use only top quality, brand new, CDC or Quantum mechanisms.

We use American Military Standard quantum mechanisms in some of our Hard drives which are very high quality and come with a 2 year manufacturers warranty (from date of manufacture)

52HD- 52Mb 11ms

Uses Quantum drive £429.99

32Mb Supra drive Special offer £ 399.99

61HD - 61Mb 24ms Special offer £ 429.99

84HD - 84Mb 24ms Special offer £ 549.99

We can assemble any of above Hard drives with ICD boards which include a clock for just an extra £15.

Phone for other capacities

Peripherals

MCS Mouse (ST) 270 Dpi, microswitched	£ 20.99
Golden Image Mouse (ST or Amiga) 290 Dpi, microswitched	£ 20.99
That's a Mouse (ST and Amiga)	£ 24.99
290 Dpi, microswitched, Switchable between ST and Amiga	
Contrack Ball (ST or Amiga) Trak ball	£ 34.99
Topstar Joystick	£ 23.95
Golden Image Hand scanners (ST or Amiga)	£ 224.99
Golden Image scanners feature 100, 200, 300, 400 Dpi resolution.	
105mm scanning head, 64 grey scales and Excellent "Migraph Touch up" software.	
Forget Me Clock	£ 24.99
40 disk box, lockable	£ 6.99
80/100 disk box lockable	£ 9.99
Mouse mats from	£ 5.99

A4 Scanner

- 200 Dpi scanner.
- 16 grey scales or Black/White mode.
- High quality thermal image printer.
- Acts as photocopier.
- Works with ST, Amiga, PC, requires 1Mb RAM.
- Amiga version includes Photon Paint II.
- Comes complete with software, cable, thermal paper.
- Thermal paper available ex-stock at £7.99 per roll.

ST or Amiga Version
£449.99

PC version + board
£479.99

IMG scanner
£49.99

The IMG scanner is a device for scanning photocopied material at horizontal resolutions of up to 1000 Dpi on an ST, when used in conjunction with an Epson compatible printer.

CUMANA 3.5" Drives

CSA 354: ST 3.5" drive. £69.99

CAX 354: Amiga 3.5" drive. £64.99

ST Internal drive upgrade. £64.99

The Cumana, ST internal drive requires the ST's case to be modified (full instructions supplied). The external ST drive is a high quality, slim, quiet drive which comes complete with integral power supply and so does not draw power from the ST which could cause problems. Add £3 P&P for drives.

How to Pay

You can phone your Access or Visa card details or send a cheque/postal orders made payable to Ladbroke Computing International. Please allow sufficient clearance time for cheques.



33 Ormskirk Road, Preston, Lancashire, PR1 2QP Open Monday to Saturday 9:30am to 5:00pm. Phones answered from 9:00am. Dealer enquiries welcome. Ladbroke Computing International is a trading name of Walton Marketing Limited. All trade marks recognised.

- Autoparking 3.5" mechanisms.
- Full metal case suitable as monitor stand.
- On/off button and DMA device selector mounted on front.
- Integral PSU.
- DMA Out port for daisy chaining.
- Megadrive controller, low power, controls up to 8 SCSI drives.

- Compatible with emulators such as Spectre GCR, AT Once.
- Up to 255 partitions, up to 1 Gigabyte in size.
- Selection of Accessories/boot partition with boot editor.
- Backup & utility software provided. Also includes Midstudio demo software.

New Prices

New Prices

Upgrades

Amiga boards

Includes Enable/Disable switch

512K upgrade board £34.99

512K board with clock £39.99

STE SIMM's

512K SIMM's upgrade £39.99

2Mb SIMM's upgrade £119.99

4Mb SIMM's upgrade £239.99

512K STFM, 16 or 4 chip kit	£ 39.99	512K ST board+chips, kit	£ 59.99
2Mb ST board+chips, kit	£ 159.99	4Mb ST boards+chips, fitted	£ 344.99
TOS 14 kit (6 or 2 ROM's)	£ 39.99	STFM Blitter chip, kit	£ 39.99

Please check the configuration of your machine with our staff before ordering any upgrade. See service centre for fitting charges. All upgrades carried out by our service centre carry a 90 days parts and labour guarantee. Please add £150 P&P for upgrades priced under £100.

Spectre GCR

"Power of the Mac, without the price."

- Reads, writes and formats Mac disks.
- Supports Hard drive and second floppy.
- Compatible with STE, Stacy.
- 30% bigger screen area than Mac Plus.
- Runs 20% faster than Mac Plus.
- Software upgrades available.
- Send SAE for Spec' sheet.

Spectre GCR
With 128K ROM's

£369.99

We are the consistently longest serving supplier

Quality Disks

Qty	Bulk Sony or Kao		Sony Brand Boxed in 10's
	Loose	Boxed	
10	£ 5.99	£ 6.99	Includes x10 Ryford black plastic box £ 9.49
40	£ 20.99	£ 26.99	Includes x40 Lockable, disc box £ 34.99
100	£ 48.99	£ 57.99	Includes x100 Lockable, disc box £ 84.99
150	£ 66.99	£ 83.99	Includes x150 Posso Stackable disc box £ 125.99

All bulk disks are top quality Sony or Kao, not cheap seconds. All disks carry an unconditional lifetime guarantee. Please add 75p P&P for each 10 disks.

Ladbroke
Computing
International



(0772) 203166 Fax 561071

KAO
MF2DD
1Mb capacity

TDK

THE WORLD'S FINEST DISKS FROM T.D.K & KAO SERIOUS QUALITY FOR SERIOUS USERS

Free delivery on orders over £50

BRANDED BOXED IN 10'S WITH LABELS

	KAO	TDK
3.5" MF2DD 135 ipl DS/DD	£8.00	£9.00
3.5" MF2HD 135 ipl DS/HD	£15.00	£16.00
5.25" MD2DD 96 ipl DS/DD	£5.00	£8.00
5.25" MD2HD 96 ipl DS/HD	£8.00	£10.00

KAO DISKAROO DISK WALLET CONTAINING 10 BRANDED MF2DD DISKS £10.00
KAO MF2DD BULK DISCS 8 COLOUR: BLUE, GREY, RED, YELLOW, GREEN, BLACK, ORANGE, FOG WHITE

	50	100
1 MEGABYTE 3.5" MF2DD BULK 50p each or	£24.00	£48.00
2 MEGABYTE 3.5" MF2HD BULK 75p each or	£35.00	£68.00

(PURCHASERS OF 100+ DISKS: WE WILL INCLUDE A FREE 3.5" DISK DRIVE CLEANING KIT)
All above disks are 100% error free & warranted free from defects & as such carry a 1 for 1 guarantee
POSSO BOX 3.5" + 5.25" ONLY £14.00 EACH.
DISK BOXES 3.5" 40 cap £4, 3.5" 80 Cap £5, 5.25" 50 cap £4, 5.25" 100 cap £5
STAR PRINTERS LC-10 Mono £150, LC-200 Colour £210, LC24-200 mono £255, LC24-200 col £290.
HP DISK JET 500 ONLY £495. - All include FREE IBM printer lead.
NB All prices inc. VAT with FREE postage & packing on orders over £50.00. Overnight delivery £8.00 extra.

K.C. VIDEO, 6 & 8 DONCASTER ROAD, SOUTH ELMSALL,
NR. PONTEFRAC, WEST YORKS, WF9 2YZ
TEL: (0977) 649100 FAX: (0977) 643312

Access

VISA

◆ FOR SALE

C64 1541 MPS801 tape deck and lots of disks and tapes £200 the lot. Ring (04022) 23714 ask for Robin or leave message on ansaphone. Also some original Amiga games.

ATARI 520 STFM with Pro-12 games, blank disks, PD software and diskboy + joystick, mouse, etc. Selling due to house purchase £195 o.n.o. (0742) 425525 (Ian).

AMIGA 2000 2Mb, 40Mb hard drive, Citizen Swift 24 pin colour printer, Philips stereo monitor, 600 blank disks, £1400 o.n.o. Phone Shaun (042121) 3989.

TEXAS TI99 modules and books for £3.50 each. Call Les on (0245) 72572 after 6.00pm.

AMSTRAD PCW 8256 wordprocessor incl. manual and disks £200. Tel: 091-388 6329.

LOADS of Speccy books, hardware, software. Send SAE for list: 50 Foxhove, Coulby, Hewham, Cleveland, TS8 0RU or (0642) 598935. Still have disciple AMX mouse, microdrives, Alphacom, paper, light pens.

14" COLOUR T.V. £75 as new. Atari ST games originals £2-£5, Remote control VHS video recorder Grundig £75, single 8 sound movie camera £65, Battle Rangers Arcade machine £125. Croydon 081-689 5883.

SEGA megadrive, Pal, English/Japanese compatible, Super Shinobi free. Excellent condition, only two months old, fully boxed, only £110 o.n.o. Ring Mike Holt after 4pm on (049481) 6782.

CASIO CZ101 midi keyboard. Ideal for Atari or Amiga. With manuals + midi leads + power supply. Excellent condition £150 o.n.o. Phone Mark on Milton Keynes (0908) 566861 eves.

SAM Coupe with disk drive, brand new, unwanted xmas gift. New chip fitted, only £160. Telephone Tim Forder (Northern Ireland) (0762) 330394.

XCAD Pro Amiga. Unwanted gift. Swap for hand scanner or 'Amas' sampler or colour monitor. Consider any offer/swap. Can deliver 50 miles radius Newbury Berks. Phone Tommy (0635) 36916 after 6pm.

AMIGA games for sale, all originals £5 to £10 for list: Thomas McMahon, P.O. Box 3026, Dublin 24, Eire. 101% reply.

IBM Tandy MS-DOS compatible (Sierra) software adventure games (Iceman, Spacequest etc.) from £5 to £25. Also Home Accounts and tutor disks for DOS and PC. Full list - telephone (0203) 448759.

LORENZO'S DOMAIN

AMIGA Public Domain, Shareware, Games & Hardware

144 100 Greatest C64 Tunes
152 Sound Engine by Absence
153 Noiseplayer V3.0
160 Glideascope 4 by Cryptic
163 Studio Music No 9
166 Echo Music Vol 1
232 Safe Sex Demo
239 Goldfire Megademo
253 Rebels Megademo
254 No Brain No Pain
260 Trilogy Megademo (2 disks)
261 WarFalcons Purple
263 Lorenzo's Introspective 1

308 Nightbreed Slideshow
309 Forgotten Realms Slideshow
323 Future Visions Slideshow
320 Fast Cars Slideshow
432 Donald Duck Anim
433 Dragons Lair 2 Demo
500 Jazzbench
502 Uedit Wordprocessor
513 Clip Art (6 Disks)
515 NIB Copier
710 Flaschbeir Game
714 Indianapolis 500 Demo
707 Paranoid Game

ALL
PD
★
99p
PER
DISK

Please add 50p to total order towards P&P
30 COLQUHOUN SQUARE, HELENSBURGH G84 8AQ
TEL 0436-78822

WANTED



DEAD
OR
ALIVE

USE YOUR VOICE
TO OUTDRAW THE
GUNFIGHTER

CASH PRIZES

0898 31 35 94

INFODIAL POBox 36 LS1 4TN Call charges 33p Per Min Cheap 44p Per Min All Other Times

ATARI Mega 4ST, 4meg memory, Hi-res monitor, 43meg hard drive, all new, very little use, will split, open to offers: (0495) 272092.

AMIGA games for sale form £1 - £25! All original boxed, as new. Tel: (0860) 444594 or 021-459 7576. Also printer cable £4 (spare).

OPUS EGA monitor and graphics card £150. Also Amiga PD software wanted. Tel: Steve (0427) 616995.

AMIGA A500 2nd floppy drive, 512k expansion modulator, joystick, (boxed) £400. Tel: Steve (0427) 616995.

LASER Genius Assembler for Spectrum £6 + post call (03985) 438 or write: 2 Town Mead, Oakford, Devon, EX16 9EW.

ATARI 1040 STF computer, Philips colour monitor and Citizen 120D printer. Also included STOS Basic and 1st Word Plus, 20 disks £550 o.v.n.o. Phone Bristol 825702 after 6pm.

AMIGA mini-amp stereo, Deluxe Paint 2+3, Photon Paint, Amos, GFA Basic, Instant Music, manuals, books, sale £300. Call Chris 071-221 6690 (London).

ATARI Portfolio, printer interface and lead, 32K RAM card and all disks and manuals. Valid reason for sale £150 o.n.o. Call Howard after 7pm weekdays only (0532) 673959.

AMSTRAD CPC range colour monitor. Excellent condition. Need quick sale £80, no offers. Contact Steve on Harlow (0279) 434191 after 5pm weekdays.

WANTED FOR CASH

Amstrad PC's, PCW's, Amigas, Atari ST's. Printers, Lasers, ANY QUANTITY CONSIDERED, working or not.
DMR ELECTRONICS: 0274 817889

ATARI ST advanced OCP Art Studio by Rainbird Software £10.00. Original boxed and with manual. Contact Stephen, 8 Roddens Gardens, Castlereagh, Belfast, BT5 7JJ, N. Ireland.

AMSTRAD SM2400 modem, fully automatic, complete with Mini Office comms software + latest public domain comms packages, suitable for Atari ST + 3 original ST games, £120. Phone (0709) 370149.

ATARI 520STFM 34 games, demos, PD magazine disk, boxed £250. Also Word Perfect v.5 for 3.5" PC, original but no box or manual £70 o.n.o. Neil (0737) 247242.

AMIGA Action Replay Mk II. Brand new, boxed, with instruction manual, one month old £35. Write: 5 Broughton Street, Preston, Lancs, PR1-7US, enclose tel. no for quick reply.

ATARI ST Prospero Fortran 77 version 1.1 with Gem DOS £75 or near offer. Cambridge 242250.

DOUBLE 1.2M floppy MS-DOS business machine plus dBase, Wordstar, Lotus, languages etc. Needs repair! £75 o.n.o. Phone Sam (evenings) (0736) 788286.

BBCB Issue 7 very good condition 40/80 DS/DD technomatic disk drive, practically unused + 15 blank disks + manuals. Tel (0202) 747 226. Buyer collects, £190.

Dr. T Prism Sequencer copyist apprentice software midi card for PC unused, unregistered £175. 16 100NS 256K chips, original receipt £20. Contriver Atari mouse pack virtually unused £9, will post. 081-692 8129.

HYUNDAI HMM 1401 paper white monitor, tilt swivel base 14" flat screen as new £50. Tel: (0296) 625779.

COMMODORE PC10 'XT' compatible dual 5.25" floppy disk drive 1084S video colour monitor, enhanced keyboard Mannesman Tally printer, wordprocessor, database, games, instructional manuals. Contact Christopher 081-997 2361, 6 months old, £850.

AMIGA Digi-Paint 3 £30, The Works £30, Pro-Sound + Midi + software £30. Ruby View Comms £20, DPaint II + Art disks £20, game £3, all original software/manuals, TV Mod. £10. Tel: (0846) 651257.

ALPHATRONIC CA/P2 computer runs CPM & Basic £50, buyer collects or pays carriage (approx. £20) Tubb: (0293) (Crawley) 513354.

SPECTRUM 48K super 5.25" disk drive, interface and manual, £150. Also interface 1 Microdrive and manual £50 o.n.o. Please leave your name and number on (0232) 713576 and I'll phone you back.

100 3.5" Sony disks unwanted gift in sturdy Sony unopened box £85 plu p&p, worth £120. Tel: Steve on (0962) 712062.

C64 CASSETTE, 10 games, joystick, light gun, books + magazine, 6 months old, £180. Phone Alex on (0293) 522375 after 6pm.

PRINTER serial 8056 dot matrix RS232 1200 BD leads/HBK £25 + post. Tubb (0293) (Crawley) 513354.

ACORN Archimedes 310, base system, podule backplane, 20Mb hard drive, new Logitech mouse (as on A3000), lots of PD, other software, £800. Phone Tim on Ely (0353) 698935 at any time.

ATARI 520STE powerpack approx. 30 games, 100 utilities + PD, STOS + compiler, mastersound, Degas Elite, mags + coverdisks and much more £400. Phone evenings 071-733 9861 Brian.

AMIGA A500 (v1.3), 1 meg, 2nd disk drive, Philips 8833 stereo hi-res monitor, Checkmate A1500 expansion casing. All boxed complete with manuals and leads, £570 o.n.o. Tel: (0843) 584444 (after 4pm weekdays).

AMIGA and Spectrum (tape) hardware/software for sale. Most less than half price including Amiga Resolution 101. SAE for list: C. Jackman, 3 Albion Terrace, Lexham Road, Utcham, Kings Lynn, Norfolk, PE32 2QQ.

C64, tape, modem + software, midi interface + software, loads of games, utilities, joystick, all cables, manuals etc. Swap for Amiga 500+ games. Call Ronan (0861) 531887 after 5pm.

FOR SALE Yamaha PSS780 midi keyboard with midi leads and some software for ST, 3 months old, only £150 o.n.o. Ring Simon on (0904) 625016 after 7pm.

STEREO audio leads. Perfect stereo sound from your computer, all leads 5 metres long. A bargain at only £5. Send P.O.'s to Andrew Tuck, 5 Brendan Avenue, Loundsley Green, Chesterfield, Derbyshire, S40 4NI.

520STFM expanded to one meg plus £1000 in games only £400. SM124 monio monitor for £80. Contact Charles on 081-968 5114 after 5pm.

FOR SALE Star LC24-10 printer with lead and spare ribbons, all reasonable offers accepted, around, £180. Phone after 6pm, ask for Andy on 081-44 0095.

SEGA megadrive for sale (Pal) brand new, two weeks old, unwanted gift £135. Tel: Julian on (0742) 438542 also Amiga games for sale form £3 plus!

ACORN Electron plus 1 plus 3 PSU Brother M1009 printer view w/p multifont NTQ T2P3. loads of software and tape player, magazines, books, manuals, cables. Offers from £250. Call 061-4455108 after 4pm.

LOTS of Spectrum software for sale. For list send SAE to K. Jarman, 18 Poplar Close, Biggleswade, Beds.

SPECTRUM +3 tape recorder, leads, dust cover, over £400 software, joystick, manuals, everything you need, worth over £600, bargain at £250. Phone (0327) 60351.

ATARI ST software £5 each. Phone (0734) 869181.

COMPUTERS

FOR HOME AND BUSINESS USE (PRICE SMASH)

Amiga's Screen Gems Pack.....	£359.99	Sega Megadrive	£169.99
Atari ST Discovery Packs	£269.99	Sega Masterplus	£89.99
Atari STE Turbo Packs	£359.99	Phillips CM 88133 MK II Monitors.....	£239.99
Lynx's	£119.99	Atari SM 124 Monitors	£109.99

PLUS GREAT PRICES

ON PRINTERS, DISC DRIVES AND MEMORY UPGRADES.

Mega Deal On PC'S

we also supply Business, Music / Art & Entertainment Software

Tel: SGM ELECTRONICS WIGAN 321435



Now Open

Monday To Thursday 11am - 9pm

Friday To Saturday 11am - 7pm or later



**Let this advertising
space work for YOU!!
For Only £61**

**Contact Tim Partridge
on
0225 442244**

SONY DISCS

PERFECT FOR AMIGA AND ST

10 3.5" discs only.....	£6.00
25 3.5" discs only.....	£12.50
50 3.5" discs only.....	£22.50
100 3.5" discs only.....	£40.00

ATARI ST PUBLIC DOMAIN CATALOGUE £1.00

mph
COMPUTER
SPECIALISTS LTD

10 CHANDLERS COURT,
EATON, NORWICH,
NR4 6EY

Telephone: (0603) 503382



IMx9 Simms for Atari STE £49. Phone (0734) 869181.

ICL OPD computer colour monitor £199. Phone (0734) 869181.

BBC A3000, 2Mb, 2nd drive, stereo monitor, £900 (one year old). Sale due to upgrading. Write to: M. Timms, 78 Gorse Farm Road, Birmingham, B43 5LP.

DACOM 2123AD modem, v21, v23, 1200/1200 mode, auto everything, error correcting, memory, BBS software, £100 o.n.o. (0625) 873144 after 6pm.

DACOM 4824 quad modem v21, v22, v23, b22bis, MNP level 5, worth over £750, sell £300. Phone (0625) 873144 after 6pm.

DOUBLE 5.25" disk drive with PSU suit Amiga, BBC, ST, PC etc. Both double sided, 40/80 track switchable. Excellent condition, cost over £200, accept £110 o.n.o. (0625) 873144 after 6pm.

Z88 portable computer + 2 x 128K Rampack - 1x128K Eprom 1x 32K Eprom + spellchecker, mains adaptor, printer lead, mags + extra books, v.g.c., boxed, £260 o.n.o. Phone (0342) 328497.

TELETEXT adaptor with tuner unit for C64. Software on tape plus Easyscript wordpro and spellchecker on disk. Derby (0332) 810194 or Ripley (0773) 607490 £80 the lot.

ATARI 520STFM 1meg drive, £200 worth of games, joysticks and disks. For sale £250. Phone Mark (0494) 26640.

TREASURE ISLAND

1 2 3 4 5 6 7 8 9 10

A B C D E F G H I J

USE YOUR VOICE TO LOCATE THE TREASURE

0898 313 586

Infodial PO Box 36 LS1 4TN Call Charges 33P Per min Cheap Rate 44P all other times

**ALL COMPUTER HARDWARE AND
SOFTWARE WANTED FOR CASH
OR EXCHANGE**

**NOTHING REFUSED!!
071 221 1075**

AXE DIRECT LTD**UNBEATABLE PRICES!**

Amiga A500 + TV modulator + mouse + power supply + enhancer software. It's all you need.

AXE POWER PRICE only £319.99

THE UPGRADE PACK

As above - but with 1 meg upgrade plus 10 great games (Astra Pack)

AXE POWER PRICE only £359.99

AMIGA 1500 plus all s/w and leads

**SCOOP PRICE without monitor £649.99
with monitor £889.99**

SCREEN GEMS only £359.99
ATARI DISCOVERY PACK only £269.99
+ 10 GREAT GAMES + Joystick only £299.99

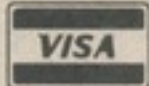
CITIZEN 120D £149.99
CITIZEN SWIFT 9 colour printer £229.99
PHILIPS CM8833 MK11 colour monitor £239.99
Commodore A590 hard drive only £269.99
External 3.5" disk drive (Amiga) only £59.95
Replacement mouse for Amiga £24.99

Two year warranty on our Citizen printers!
All prices include VAT. Courier delivery available

Make cheques/PO's payable to

AXE DIRECT LTD

61 Gainsborough Road,
Finchley, London N12 8AA



**SALES POWER HOTLINE 081-446-5950
FAX 081-446-6422**

CHECK OUT THE AXE PACK

SPECTRUM 48K, b+w TV, Multiface, modem, joystick, £500 worth of games, loads of books and mags, all boxed, bargain for £80 o.n.o. Phone Alex on 081-993 2809. 6-10pm weekdays.

2286, IBM clone, 1meg, RAM 40meg hard disk, 5.25" floppy VGA, high res, 14" monitor, DOS 3.3, hardly used, 6 months old. Mint £895. 021-555 6719.

INKJET colour printer (Integrex) Cannon type, good condition, £99 o.n.o. (0908) 641315.

C64 and Amstrad CPC disk originals, games and serious, also C64 sound sampler and sound expander. Phone for list (0582) 760386.

COMMODORE 64 for sale, cassette deck, Super Sprint joystick, introduction to Basic part one, keyboard, over £300 worth of games. The lot for £150. Call Scott on 081-599 2505.

ATARI STFM good condition, 512K, loads of software, all for £140. Also Star LC10 colour printer, nearly new £140 or the pair for £260. Phone Windsor (0753) 864382.

C64 manual, leads, 2czns, 3 joystick, deks, b+w TV, 70 mags, £500+ worth software, all for £195 o.n.o. or swap + cash for ST. Phone Luton 594756 (0582). Ask for Billy. Plus 2 ROM carts + replay.

SOFTCELL SUPER SAVERS

PC Share Ware

£1.75 Per Disk Fully Inclusive

PC Type II (3)£5.00
NY Word (3)£5.00
PC File dB (3)£5.00
PC File (3)£5.00
Front Office (3)£5.00
PC Type (3)£5.00
PC Calc (3)£5.00
PC File + V3 (3)£5.00
Freeway Accts (3)£5.00
Ford Car 11 (2)£3.50
Super Astrology (3)£5.00
Page Finc. Cont. (3)£5.00
£5.00 Set £6.00 3.5

EGA Pacman£1.75
Deskjet Collection£1.75
Educational Games£1.75
Dr. Sleep£1.75
Laser Letterhead£1.75
Home Records£1.75
Share Spell£1.75
Bar Codes£1.75
Windows Toolkit£1.75
Windows Games£1.75
dbase 4 Tutor£1.75
Food Analysis£1.75
+ 100's more

**COMMODORE
STARTER
PACKS
FROM
£498**

**SCHNEIDER
COMPUTERS**

* Quality
* Value
* Free Software

10 5/14 Discs £16.00, 10 3 1/2 Discs £25.00
For further details write or phone
for a FREE catalogue!

**Softcell Services, Dept NCE, 25 Maywood, Brynna, Pontyclun,
Mid Glamorgan, CF7 9PZ. Tel: (0443) 238630 anytime**

Modems! Modems! Modems!**Modems for Amigas, Ataris & PCs**

Technical advice a pleasure

V22bis (2400 baud) Hayes compatibles from £99

Supply Solutions offer top quality, guaranteed new and second-user modems from major manufacturers at realistic prices.

All modems are fully tested prior to despatch.

**Ring 081-566-3639
Supply Solutions**

Supply Solutions 187 Uxbridge Road, London, W13 9AA
Lines open 10am to 6pm and till 8pm Mondays & Tuesdays
STRICTLY MAIL ORDER ONLY

SAM COUPE AND SPECTRUM MAGAZINE!

PROGRAMS, UTILITIES, INFO, IDEAS! NEWS, REVIEWS AND HOMEGROWN SOFTWARE MONTHLY SINCE 1987!

"OUTLET"

GRAPHICS, AND HELP PAGES, SERIOUS SOFTWARE

**SPECIAL OFFER! Latest issue £2.50 to newcomers on:-
+3, DISCIPLE/+D, MICRODRIVE, OPUS, TAPE, SAM DISC
CHEZRON SOFTWARE, 605 LOUGHBOROUGH RD., BIRSTALL, LEICESTER LE4 4NJ**

**36p
inc VAT**

**3 1/2" Disks inc Labels - DS/DD 100% Error
Free - fully guaranteed 2 for 1 replacement**

P&P: 50 disks & over is free. Under 50 disks only £1.50
All prices include VAT. Send Cheques or Postal Orders to

KYC Disks

51 Barmouth Road, Wandsworth, London, SW18 2DT.
Telephone 081-870 0469

VGA colour monitor for IBM PC with lead £200 o.n.o. Amiga 2000 8Mb RAM board, 2 megs, populated, boxed, unused, £200 o.n.o. Tel: (040377) 545. W. Sussex.

C64c (still boxed), datacassette, joystick, manual, all connecting leads. Over £500 worth of software, including Last Ninja II, Batman(s), Rainbow Islands, Silkworm, Vendetta, £230 o.n.o. Ring (0273) 554510.

MEGADRIVE with Golden Axe, Eswat and Rambo 3. Runs British Japanes and American carts. Also has Text Convertor. Comes with PSU, joypad and headphones, as new, £150. Contact (0226) 746257.

4 256K SIMMS boards for sale. 2 will upgrade 520STE to 1Mb £20 o.n.o. per pair. Phone Pete on Wakefield (0924) 896012.

MUSIC-X version 1.1 £49, Music-X Junior £25. Both as new, original, boxed with manuals and registration cards. Telephone Chris, Farnborough (0252) 373177.

AMIGA A590 20 meg hard disk drive, brand new, unwanted gift, full guarantee £200. (0746) 766897.

IBM PCXT case £40, XT keyboard £15 plus p&p. F15 Strike Eagle II £15, Memotech MTX512 computer c/w all leads and P.S.U. £25. Tel: (0325) 486181 after 6pm.

TOSHIBA MSX 64K home computer + extras and £200 software, mint, £100 o.n.o. Phone 041-634 5273 after 6pm.

PC ENGINE (Pal), boxed for sale. 9 games for only £210, I must be mental, includes p&p. Games like R-Type, Don Doki Don. Write to: R.K., 4b Currents Lane, Harwich, Essex, CO12 3DE.

ST MAGS FOR SALE ie a large number of ST User, ST Action, ST World. Offers: phone (0404) 44069 after 6pm. Buyer collects.

AMIGA Screen Gems pack for sale. Software only, £40 or will swap for Amiga software ie Captive, F29 Retaliator, etc. Phone (0404) 44069 after 6pm.

AMIGA A500, one meg, external drive, 1084 monitor, sound sampler, loads of software, books, etc. Cost over £1,600, will sell for £900 o.n.o. Call David (0924) 261450 for more details.

OLIVETTI PRINTER PR15 150cps, 9pin serial or parallel, sheet or tractor feed. New ribbon, £50 o.n.o. Spare tractor feed £15. (PR15/1450) after 6pm, Richard: 061-485 6580.

ARCADE Machines Battle Rangers £125.00 including Sidearms Board. Tiger Heli £70.00 including Commando Board. Atari ST games from £2.00 or swap. 14" portable colour TV £75. Private sale Croydon: 081-689 5883.

ATARI ST GAMES: Resolution 101, Power Drift, Shadow Warriors, Batman £4.00 each. Also Dragons Lair + Space Ace £8.00 each. Hyper Paint, Hyper Draw, together for £10.00. All originals, call Dan 081-771 2969.

CASH FOR COMPUTERS

BUY! SELL! EXCHANGE! REPAIR!
NEW & USED!

B & B COMPUTERS

HUDDERSFIELD (0484) 430970



FAX: (0484) 432960



WANTED: DEAD COMPUTERS

AMIGA SOFTWARE 24 quality games. Sell £150 o.n.o. approx. £10 each. Includes Off Road, Kick Off, Double Dragon 2. Swap for Gameboy + games, or Lynx games. Phone (0225) 790625 after 4pm.

AMSTRAD FDI disk drive for sale. Still boxed £50, 100's of Amstrad tape games for sale. SAE for lists, 30 Cardinal Way, Haverhill, Suffolk, CB9 0DW.

COMMODORE C128 + datacass + £700 of software £100. Printers: CBM MPS1000 supports IBM/C64 par/ser interface. Also Diconix Inkjet portable mains/batt A4 - 80col HQ-Print as new, Need A590 or cash. David: (0934) 513086.

MEGADRIE plus Rambo3, Super HangOn, Golden Axe, Eswat, joypad, PSU, headphones. Has text convertor and runs all games. Only 4 months old, only £165. Find one better! Contact (0226) 746257.

PC-ENGINE for sale. Joypad, power pack and carrying case, only 10 months old. Sell for only £99. Contact Richard (0271) 43216 after six.

DATA COMM modem 2400 Hayes with manual £66 inc. delivery. QL JM £40. EGA card £20. Books and software, very cheap. Swap above for 1.44 drive, one item. (0404) 892806.

AMOS as new complete, £25.00. Phone (0827) 51738.

① **ATARI MEGA 4**
SM 124 Mono Monitor, SH205
20Mb Hard Drive, Cameron
Hand Scanner**£965.00**

② **ATARI SLM 804**
Laser Printer **£695.00**

Items 1 and 2 together ..**£1595.00**

③ **ATARI 520STFM**
+ 2nd Floppy**£195.00**

④ **SM125** Mono Monitor ..**£65.00**

Items 3 and 4 together ..**£250.00**

PHONE: Rob
(0865) 741331 ans

AMSTRAD PC1512 colour monitor, twin 5.25 disk drives, 3160 printer, mouse £400 o.n.o. or swap for Amiga hard drive. Tel: (0695) 423161 (day) (0695) 32733 (eve). Will deliver in Lancashire.

RPG's for ST, all boxed. Dungeon Master, Chaos Strikes Back, Drakhen, Ultima V, Xenomorph, £6 each. Phone Paul on 091-281 8903, 48 St. Georges Terrace, Jesmond, Newcastle, NE2 2SY.

HARD DISK - 20Mb 3.5" Western Digital MFM uncased and unused, £125. Phone 051-493 1473, ask for Neil.

CPC464 for sale. 200+ games, 2 manuals, 1 joystick, modulator, green monitor and loads of mags. Worth £600, sell for £270 o.n.o. (0202) 721588.

AMIGA 500, 6 months old with over £200 of games including PowerMonger, Kick Off 2, Hollywood pack, F of F pack etc. Cost £275. Phone Vis 071-582 9098 during evenings.

MACINTOSH SE twin floppy 1Mb RAM, with Macwrite, Hypercard etc. Bargain at £450. Phone Vis 071-582 9098 evenings.

ATARI ST SOFTWARE for sale, will sell £20 and £25 games for £10 or less! Also budget games for £3. Tel: Newcastle 091-268 7640 ask for Michael.

AMIGA 1.5 meg memory expansion, 1 month old, fully boxed, excellent condition and unused, £60. Tel 081-341 0424.

ATARI 130XE for sale. Cassette deck and 1050 disk drive, joysticks, over £300 worth of software, £250 o.n.o. Will split, contact Mark, (0635) 65342.

AMSTRAD CPC464, colour monitor in good condition, games, joystick, manuals, mags, printer lead, cassette holder, worth over £500. Sell for £199. For details telephone (0908) 319247 ask for Garth.

ST ORIGINAL BOXED GAMES. Must sell as upgrading. Ring (0275) 375496 evenings. All games £7.50 each, games inc. Batman, Purple Saturn Day, Rocket Ranger, Dungeon Master, Superman, compilations etc.

COLOUR VIDEO DIGITISER for Atari ST-printtechnik, boxed £70. Tel: (0277) 226621.

VIRUS FREE PD

Amiga Public Domain Software

Over 1100 disks catalogued.
More than 100 new disks added every month.
All disks distributed free from all known viruses.
Send now for our highly praised Catalogue disk.
Only £1.00 inc Postage & Packing.

Virus Free PD (Dept NCE), 23 Elborough Rd,
Moredon, Swindon, Wiltshire, SN2 2LS. England.
Tel: 0793 512321

MICRODRIVE CARTRIDGES for sale. Packs of four £3.50 per pack. Some still in wrapping, some used. Mr. B. Hilton, 6 Walnut Walk, Polegate, East Sussex, BN26 5AD.

ATARI 800XL for sale, with 1050 disk drive and about 60 disks of software, £140. Phone 021 459 0800 evenings or weekends.

SCANNER for Atari ST. Golden Image hand scanner, touch up software, as new £120. 071-435 7664.

ATARI LYNX incl. California Games cartridge, brand new, 12 month guarantee, still valid, £110. Tel (0274) 574187 - Brian. (Bradford, p&p free).

PSION LZ +16K datapack, manuals, power supply, as new, £100 o.n.o. Phone Paul Swindon (0793) 512100 ext. 153 Mon-Fri, office hours.

MODEM Racal 2400 auto answer, auto dial, complete with all leads, still boxed with instructions, £120. Phone Rob on (0656) 736986 (Maesteg).

ATARI 130XE disk drive, cassette recorder, joysticks, magazines and games c/w manuals, v.g.c. £150 o.n.o. Tel: (0784) 464598, ask for Ashley.

IBM PS2 external disk drive, 5.25" 360K/1.2meg, Toshiba portable external disk drive, 5.25", model PA7225E, both brand new, boxed with cables and never used £90 each. Steve (0203) 460410.

(0533)
440041



ALTERNATIVE IMAGE

6, LOTHAIR RD
AYLESTONE
LEICESTER
LE2 7QB

THE BIG ALTERNATIVE SCROLLER

- 20 fonts •
- 4 Defineable colours •
- Drop Shadow •
- High resolution with full overscan •
- Horizontal & Vertical scrolling •
- 9 Speeds •

Minimum requirement - a standard A500 with 1MB of RAM.
Send cheque or postal order for £50 incl. VAT to the above address
- or ring for details.

VERY FAST, SMOOTH AND EASY TO USE!

PBT ELECTRONICS LIMITED

PORT TALBOT WORKSHOPS, Unit 17,
Addison Road, Port Talbot SA12 6HZ
TEL: 0639 885008 FAX: 0639 887170

SAM COUPE COMPUTER + 1 drive	£199.99	UHF leads TV to Computer (BBC/Spectrum)	£1.99
SAM COUPE COMPUTER + 2 drives.....	£275.99	Cassette leads (BBC/Spectrum)	£1.99
SAM DISC DRIVE	£79.99	SAM Scart cables (connects to monitor) ..	£9.99
SAM 256K RAM EXPANSION	£39.95	SAM Scart cables for Microvitec cub monitor	£9.99
SAM COMMS INTERFACE	£29.95	SAM dual joystick adaptor (connects 2 joysticks).....	£7.99
SAM DISC INTERFACE	£29.95	SAM Midi cables.....	£6.49
VOICE BOX allows SAM to speak	£39.99	3.5 inch DS/DD disks box of 10.....	£5.99
SAM COUPE COMPUTER PACK (512K + DRIVE).....	£234.99	Plus D/BBC Dual Disc drive connectors ..	£14.99
SAM Advanced Technical Manual	£15.99	Spectrum 48K power supplies	£9.99
Citizen 120D printer parallel.....	£140.99	Spectrum 128K power supplies	£14.99
Mannesman MTB Parallel Printer	£135.99	A4 Printer Paper 2000 Sheets	£19.99
Parallel printer cable SAM/BBC/+D type ..	£7.99		
Parallel printer cable Spectrum +3 type ..	£7.99		
Citizen 180E printer	£169.99		

For full price list of other products please ring.

All prices include VAT - Postage Printers/Computers £5.00. Postage all other products £1.00

MGT DISC DRIVES AND PLUS 'D' INTERFACES REPAIRED.
3 MONTHS GUARANTEE GIVEN ON REPAIRS.
Please telephone before sending repairs anytime until 8pm

STAR SG10C Commodore printer, unused for year, hence £35. Call 081-397 6400.

BBC B (Issue 7 board version) complete with manuals, data recorder, loads of original software, excellent condition £135. Telephone (0495) 272358. No timewasters please.

VIDI AMIGA, Vidi chrome, Vidi RGB, one month old, £120 the lot. Action Replay cartridge £45. Odd original Amiga games at cheap prices. Phone Robin on (04022) 23714 7-9pm.

AMSTRAD PCW 8256 with software as new, perfect condition £250. (0923) 39010.

PC ENGINE (Pal) for sale with 7 games, inc. joypad, joystick, power supply unit, as new only £200. Tel: Aberdeen (0224) 826589 - Richard.

FOR SALE: Atari 520 STFM, discovery pack with 1/2 meg upgrade installed, 3 games and joystick £250. IBM PC copy II PC deluxe option board £60. RS Trio 1200 baud modem £40. Call George (0992) 461663.

ATARI 520STFM, two 1 meg drives, lots of software and books. Very good condition, offers over £220. Tel: Paul 021-422 3091 after 5pm. Can deliver within reasonable distance.

AMIGA A500 Commodore 1701 colour monitor, external disk drive, modulator, joystick, Lattice 'C' Compiler, Photon Paint, £90, maintains £150, games worth £1,300, sell for £650. Phone Lee 081-341 5545 after 7pm.

CAMERON SCANNER 200/300/400 dpi. 3 scan modes, plus black/white, comes with scanpack utility painter and reader (OCR) for the IBM PC/XT/AT £100 o.v.n.o. Phone 081-428 7326, ask for Mick after 6pm.

AMIGA A500, 2nd drive, half meg upgrade, 2 mouse mats & holder, 2 disk boxes, full of £200 worth of new software. Phone 081-907 3500.

3SEGA MEGADRIVE + Golden Axe + Ghouls 'n' Ghosts + Altered Beast + extra controller, £230 o.n.o. or swap 9,600 modem. Tel: 091-526 6741 after 6pm, ask for Frank.

CPC6128 colour monitor, 2 drives, cassette, muse, DTP, SPress, Xpress manuals, disks, w/processor, lot of disks £450. Buyer collects. Bognor Regis 828714.

Amstrad CPC464 colour monitor, joystick, games and manual £160 o.n.o. Phone Trevor on Usk 2547 after 6pm.

SEGA MEGADRIVE (Scart & pal) runs Jap., UK and American carts + 10 great games. Bargain at £390. Tel: (0736) 50130 for more details.

C.V.L.S. Tel: 0742 884183

3.5" DS/DD Disks from £32p
5.25" DS/DD Disks (Colour) from 28p
3.5" JVC branded disks £6.50 (box of 10)
3.5" DSHD 2.0 meg bulk from 85p
3.5" DS/HD branded disks from £12.00 (box of 10)

★ SPECIAL OFFER ★
10 3.5" DS/DD disks £4.30 inc P&P
20 3.5" DS/DD disks £8.20 inc P&P
P&P £3.00 per order cheques/P.O payable to:
**C.V.L.S., 92 Firtree Estate,
Thurgoland, Sheffield, S30 7BG**

WESTERN DIGITAL 20Mb h/disk, IDE, almost new, offers. 5.25" floppy drives £15 each. 720K 3.5" drive £25. XT case, PSU, fan, £40. Slim style case, PSU, £25. Coventry (0203) 460410.

DATA CASSETTE head alignment/cleaning kit. (Robocom), brand new £5. IBM Q/writer tractor feed, new, boxed, £8. Daisywheel printer, needs slight attention £10. 8" drive £5. Coventry (0203) 460410.

CBM64 + disk drive, b&w TV, instant replay, 49 key keyboard, colour plotter, + Turbo C, datacorder, x 2 joysticks, E-motion, Xybots, manuals, sound expander & more! Worth £1500+, only £490 o.n.o. Excellent condition! Phone Andrew (0353) 720201. 5-10pm mega-bargain!

MEGADRIVE, Dynamite Duke, Shadow Dancer, Mickey Mouse, Hellfire, John Madd football, Sword Varmilli, Hard Drivin', Rainbow Islands. Ring Side Angel, Strider, all £25 each. 081-592 2117 ask for Samir.

IBM AT compatible 286, 16MHz, 1Mb RAM, 44Mb HD, VGA card, FST paper white VGA monitor, immaculate, only one month old, £845. Craig Pickering, 19 Clough Road, Birkby, Huddersfield, HD2 2NZ

COMMODORE C128 runs C64 software + datacass and £1000 software, plus MPS1000 9 pin printer (NLQ) £250 o.n.o. Also Diconix inkjet portable printer for just £190. Ask for David on (0934) 513086.

TRuST P.D. Quality Public Domain for the ST

Also available 50 P.O.V. Compact Demos - ST Format's best PD program of 1990, Demo's, Games, Art, Music, Word Pro, STE. Demo's, Utilities, Educational, Clip Art, Programming, Slide Shows, Disk Mags
New commissionware labels, Plus over 80 Budgie U.K. games etc.

For free catalogue on disk send a S.A.E. and blank disk or £1.00 cheque/PO to:
TRuST P.D., 18 The Park, Southowram, Halifax, HX3 9QY.
Tel: 0422 341606.

3.5 and 5.25 twin drives, both one meg storage capacity, very reliable drives £120. Will suit ST, Amiga etc. Tel: (0495) 272358. Also 3.5 disk 60p each. No timewasters please.

STAR LCAP PRINTER, excellent condition £95. Also Pision Organiser II XP model, boxed with all manuals including extra software packs and data packs £130. Excellent condition. Phone (0532, Leeds) 610662.

AMSTRAD CPC464 plus monitor, v.g.c. with over £550 of software inc. Lightgun, bargain at £200. Tel: 021-772 6327, 5-9pm.

BBC MICRO with disk drive in working condition and Amstrad DMP2160 printer only £150. Please phone 051-727 1426 and ask for Eddie. Any evening or weekend.

ATARI 520STFM with d/sided drive and approx. £2000 of top quality software, all originals + 1 meg upgrade (needs fitting) only £620 o.n.o. Phone Paul on 071-323 5726 Mon to Fri only, 7.30am - 4.00pm.

C64 GAMES, Speedball, Op. Wolf, Armalyte, Stunt Car Racer + reset cartridge, all these for £15. Tel: (0670) 817938, Northumberland.

SPECTRUM 48K with reset button £60, includes power supply, leads, manual. Spectrum 48K needs new membrane, otherwise fully working, £20. Phone David on Hassocks (07918) 4530 (West Sussex).

PC-ENGINE and CD ROM for sale, 20 games on card, 6 on CD. As new, boxed £600 o.n.o. Contact Alan on (0932) 820413 after 6pm.

E.M.P.D.L.

AMIGA/ST P.D. LIBRARY. OPEN 7 DAYS 9am - 9pm

EMPDL. STARTER PACK. A 3 disk collection of the most useful utilities inc. Word Processor, Text Editor, Database Spreadsheet, etc.
EMPDL. BUSINESS PACK. A 4 disk collection of utilities with the small business user in mind. Includes Accounts/Stock Control, etc.
FLEXI BASE. The most versatile database around.
DADDYKINS 8. Probably the only word processor disk you will ever need.
AMIGA EDUCATION SET. A 5 disk collection of educational programs for the 14+.
LEARN AND PLAY. A 2 disk set for the younger members of the family.
STAR TREK. TOBIAS RICHTER VERSION. The very best version available.
DRAGONS CAVE. A brilliant 1/2 Meg game using the "Dungeon Master" graphics.
FISH GAMES SET. A 5 disk collection of the best games from Fred Fish.
AMIGA FUN GAMES DISK. 2 more excellent arcade games.
MR DIG. A great arcade game based on the Mr Do game (req 1 Meg).

ALL OUR DISKS ARE VIRUS FREE AND DESPATCHED BY FIRST CLASS POST ON DAY OF RECEIPT AT THE INCLUSIVE PRICE OF £2.50 PER DISK.
SEND NOW FOR OUR DISK BASED CATALOGUE GIVING DETAILS OF OVER 1800 DISKS. STATE CLEARLY THE MAKE OF YOUR COMPUTER.



Cheques & P.O.'s payable to:
**E.M.P.D.L. 54 WATNALL ROAD,
HUCKNALL, NOTTINGHAM, NG15 7LE
0602 630071**



AMIGA A500 (£400), 2nd drive (£55), 1meg (£90), 2 disk boxes (£10), 2 mouse mats & holder (£15), £2000 worth of mostly all new software (phone for list). Still under 11 month guarantee £685. (With Sculpt Animate 40 £800) + Superplanner (£100). Phone 081-907 3500.

BBC MODEL B, 40T s/sided disk drive, Enigma ROM, joystick, £500 of games and serious software, perfect working condition, £190 o.n.o. Tel: (0670) 824273 evenings.

PSION ORGANISER XP and CM for sale, £70 and £40 each. XP boxed, as new, 16K datapack and formatter available. Phone (0793) 782748 for details, ask for Adam.

PC ENGINE (Pal) with several games £120. Phone for details, genuine reason for sale. Phone Swindon (0793) 782748, ask for Adam.

AMSTRAD 9512, one year old, very good condition, daisywheel printer, unwanted gift. Phone (0602) 208600, after 6pm. Ask for Don or Isobel £365 o.n.o.

AMSTRAD PC1512 with 10Mb hard card, £325 (mono). Epson RX80-FT printer £60. Phone (0252) 625811.

3 COMMODORE Pet computers, 3 double disk drives, 1 hard disk drive, 1 printer, £200 o.n.o. Buyer collects, 1 Sirius computer and disk drive, manuals, program, disks, £60 o.n.o. (0452) 501831.

PRINTER top spec Amstrad LQ5000 di 24 pin, LQ, RS232 and Centronics wide carriage, PC, Atari, Amiga compatible. Cable, genuine reason for sale £190 o.n.o. Tel: (0453) 835142.

TOTALLY UNREAL PC engine (Pal), boxed + 9 games, mint condition, inc. p&p only £210. To: R.K. 4b Currents Lane, Harwich, Essex, CO12 3DE.

PC ENGINE, joystick, games, CD ROM, £320. May separate. Also megadrive games for sale, e.g. Magical Hat, £25. Tel: (0254) 53195 after 6pm and ask for Kinman.

DO YOU USE your Amiga for art? Want a bargain? Look no further - Sculpt 4D, original, boxed, unused £100 or swap for Genlock. Don't delay, phone today! (0726) 72886.

AMIGA GAMES. All originals, 60 titles, including F29 Retaliator, Unreal, Kick Off, Days of Thunder, etc. from £3 to £10 each: or £200 for the lot! Tel: Max (0726) 72886.

REPLAY 4 for Atari ST. This complete sound digitiser and drum machine is by far the best available. Sell for only £35. Call Pete on (0942) 723503.

ATARI STFM for sale incs. 25+ games, 2 joysticks, 4 player adaptor, dust cover, lots of magazines and demo disk all boxed, £280. Please phone Neon (0903) 722820 after 4pm, Monday to Thursday.

MODEM PC half card v21, v22, Hayes compatible. Boxed with instructions only £60. Phone Peter after 6pm on 041-774 7093.

- ☐ **TWIN 5 1/4" DISK DRIVES.** A nicely cased self-contained unit with its own power supply. Product of a famous Jap maker this is IBM compatible 360K twin double sided. Brand new with data £59.00 plus £3 delivery.
☐ **3 1/2" DOUBLE SIDED DOUBLE DENSITY DISK DRIVES** all by famous Japanese EPSON Co. All these models in stock with makers data: SMD240H, SMD290H, SMD240L, SMD180B. Also 5 1/4 models SD540 & SD580L, all brand new and will work with most computers and offered at £39.50 each + £3 p & p.
☐ **3 1/2" DOUBLE SIDE NEC** disk drives still available but not many left will work with the Atari ST etc. £59.50 + £3 delivery.
☐ **PRINTER PLOTTER** by Sharp originally listed at £150.00 brand new with data £20.00 + £3.
☐ **SUPER MULTITESTER** Ex British Telecom, as new tested and guaranteed. Original cost probably over £50, yours for only £7.50. Leather case for this £3.00 + £3.00 post.
☐ **110 WATT POWER SUPPLY ASTEC** switchmode, 230v mains input: 38v at 2 1/2A & 5v 3A outputs, encased and fitted on panel mounting plate with mains input socket and on/off switch, made for use with computers. Brand new, price- this is £15.00 post paid.
☐ **COMPUTER GAME BARGAINS** you can buy a box of 100 assorted computer games for the Spectrum, Acorn, Commodore etc, price £20.00 box plus £3.00 post.

M & B Electrical Dept NCE,
 12 Boundary Rd, Hove, Sussex. BN3 4EH.
 Tel: 0273 430380 Fax: 0273 410142. Telephone orders welcome

COMMODORE MPS801 dot matrix printer, for use with C64, will print text and graphics. As new, £90, buyer must collect. Also C64 sound sampler, £30. FM sound module £30. (0748) 72470.

SPECTRUM +2 with £300 software collection, joystick, dustcover, mags, many extras, boxed, will sell £225. Phone 031-552 6325 after 6pm. Ask for I.B.M. buyer collects.

◆ GOODS WANTED


WANTED: Any working home computer of any make. I will swap my six personal money making business manuals, total value £65.90 for one. Telephone: (0949) 831206, ask for Mr. M. Tomlinson.

ST owners! Anyone want to swap demos, PD? Send your list for 100% reply: M. K., 7 Montgomery Street, Birmingham, B11 1EN. All letters replied.

SWAP Devpac II (Amiga) for Argasm. Phone only at weekends, (02477) 71888. Might pay a bit as well.

PASCAL compiled (commercial) for Commodore CBM, Amiga wanted. Will pay or swap for other Amiga software etc. Richard 061 485 6580 after 6pm please.

WANTED: 1 meg D/S drive for ST internal only, must be cheap or swap my top software or mixture of cash and software to: Paul, 3 Moorend Ave., C'wood, Birmingham, B37 5SD.



**TUTORIAL MANUALS AND
SMALL BUSINESS IDEAS**

**THE COMPUTER
WORKSHOP**

THE ULTIMATE HOME BASED COMPUTER SERVICE

DEPT 7, P.O. BOX 111,
ROCHESTER, KENT. ME2 2TS
TELEPHONE 0634 710941 FAX 0634 718062

SUCCESS AT YOUR FINGERTIPS WITH YOUR MICRO COMPUTER

The COMPUTER WORKSHOP is offering you the chance to start your own home based business. Your micro is capable of making mega money with the right guidance.

With us guiding you step by step you can enter into the world of high finance. Even the smallest of home computers is capable of doing much more than just playing games. If used to its full potential your computer is capable of running most small, or home based businesses.

Let us help you unlock the full potential of your computer today, and start your very own, home based business tomorrow.

For more information send an S.A.E. to the **COMPUTER WORKSHOP, DEPT 7, P.O. BOX 111, ROCHESTER, KENT. ME2 2TS.**

WE ARE NOT ATTACHED IN ANY WAY TO THE MAIL ORDER INDUSTRY

APOLLO Modem (BBC Watford Electronics) ROM software and/or manuals needed for (perhaps) working modem (info needed). tel: Ed, 081 682 0745. Write: 116 Eswyn Road, Tooting, London, SW17 8TN.

WANTED Amiga: mouse, manuals, software and Mastersound. Cash waiting for any of the above. Tel: (0630) 58329 after 5pm.

WANTED: Atari ST system, fair price paid for good system offered. Telephone (0495) 272358 no silly balloon inflated prices please.

WANTED: Amiga Action Replay cartridge mark II. Swap for: Carrier Command and Starglider 2 or offer up to £30. Phone Simon (evenings) on (0623) 644179.

WANTED: Vic 20 power pack. Tel: Northampton (0604) 700632.

ATARI 1040 wanted. No monitor needed, but I am also interested in music software such as Creator or Cubase (with manuals). Ring Mike daytime: 071 926 4673 eves: 071 587 1327.

WANTED: Amiga 2-3 meg demos. Good price paid. Tel: Viper on (0473) 713715 between 6-9pm only please!

WANTED: Cheap computer for friend. Atari to Spectrum. Anything working considered. Please send details to: Nigel Richardson, 17 Butter Hill, Carshalton, Surrey, SM5 2TW.

WANTED: A500 with Fatter Agnus and Kickstart 1.3. Also wanted Megadrive Pal. Good prices paid. Phone (0424) 211928 after 6pm, 7 days, consider Pix with Lynx, Record deck, or TV400.

COMMODORE Amiga A500, no fancy bits, or games or monitor, just main machine and power supply, plus modulator. Contact Tim on (0353) 648935 to discuss deals any time.

◆ SERVICES

WIZARD P.D.

178, Waverley Rd, Reading, Berks, RG3 2PZ

* HIGH QUALITY
 * FAST SERVICE
 * VIRUS FREE

* LOW PRICES
 * FULL RANGE
 * HELPLINE

Many unique programmes written by and for us

FULL DISKS Our s/sided disks average 325K
ALL DISKS Are verify copied & immunised!!
TOS 1.09 No problem all compatible!
STE Incompatible discs all listed!

**BEGINNERS
WELCOME!**

3 Disk Starter Pack £5.00

Budgie Disk - 86 disks to choose from.

Club Packs - 5 single or DS/Disks of your choice only £9.
★ £1.00 off voucher with copy of the advert ★

FOR FREE CATALOGUE SEND SAE OR RING 0734 574685
 FOR FREE DISK BASED CATALOGUE SEND BLANK DISK AND SAE

C.M.T. TECHNOLOGIES

★ Stock Room Clearance! ★

IBM compatible PC hardware & software

Phone for details

0860 861622 (mobile) or 0426 937658 and ask for Bruce

SCANNING service, up to A4 200dpi 1meg or PCX format for IBM PC or Atari ST 3.5" disk. Phone John 081-767 4761, almost anytime.

EYECATCHING custom written Atari ST(E) demos for use in shop windows or user groups etc. Send for free info sheet to: T.N.P. Productions, 44 Laund Nook, Belper, Derbyshire, DE5 1GY.

AMIGA midi help needed desperately! Pay negotiable for anyone willing to make a South London home visit. (Dr. T or Music-X). Ring Mike daytime! 071-926 4673 night 071-587 1327.

SCANNING and digitising. Lots of Clip Art available in various formats including 1Mg, IFF/ILBM, Tiff, Gif, Macpaint, Printmaster, Degas, PCX. Send SAE to: 53 Lenaghan Park, Belfast, BT8 4JB.

WANTED: Amiga A500 users interested in forming a user group. Also ust write if you're into programming, PD, swaps, etc. Stephen Hamer, 98 Crebilly Road, Ballymena, County Antrim, BT42 4DS.

WOULD Roy Woodfine please contact Clive Parker about the hard disk drives. I am still at the same address. Phone (0275) 375496. Please return the money paid.

◆ ANNOUNCEMENTS

TYPECAST! New PD library for the Atari ST/STE. Solely for DTP, WP and Art. No games, send SAE + disk for disk catalogue to: Paul Sealy, 31 Hartfield Crescent, West Wickham, Kent.

ATARI ST

Z-80 CROSS ASSEMBLER

A fast, friendly, development system for GEM on the Atari ST, comprising GEM text editor, macro cross-assembler, linker and RS232 transfer facility for downloading to the target machine.

£79.95
 incl VAT
 incl P&P

MAINTENANCE UTILITY

£19.95
 incl VAT
 incl P&P

'MAKEST' - the maintenance utility that slashes program development time by automatically assembling, compiling, and linking several source code files - vital for large projects.

Cross assembler demo version £5 from: -

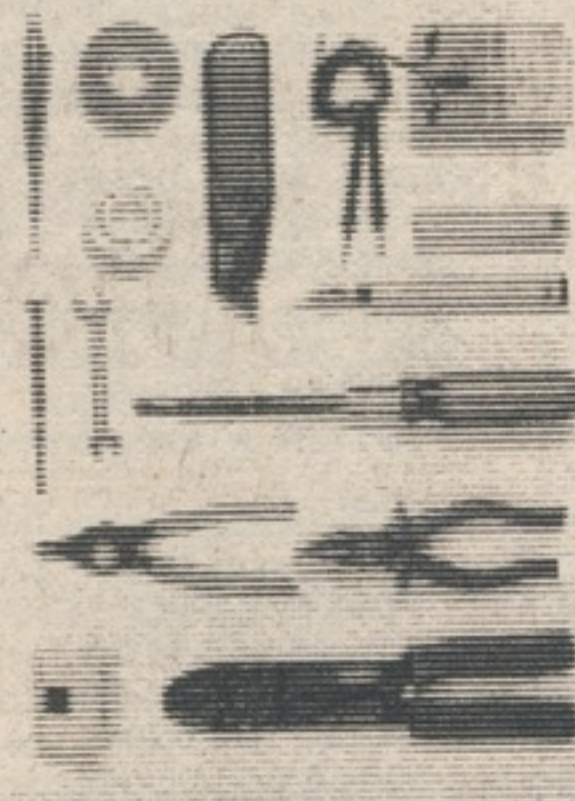
0908 - 615104

D & S Software

PO Box 908, Newport Pagnell, MK16 8YJ

ATARI ST

CIRCUIT CITY



Many of the ideas and projects in Circuit City can benefit from books. Keith Pomfret dusted his bookshelves and found a rain forest of knowledge hiding on the teak.

If you are going to delve inside your machine, it's important that you know what is in there and what it does. The book that came with the machine is generally next to useless when it comes to a sortie inside the machine and beyond the warranty.

An afternoon in a good library or bookshop will show you that everyone and their pet dog is writing about computers nowadays. In the local bookshop, the technological revolution has beaten religion into second position for shelf space. A book on the operating system of the computer isn't too difficult. Machine-specific references on the documented bits that the manufacturer doesn't mind us playing around with are easy to come by, but general books on what does what and how are rarer.

As bookshops don't generally keep a pet wirehead on hand to consult you're on your own. The first thing to get is the technical manual for your machine and the best place to get it is from the manufacturer. It sounds easy if you say it quickly. However, persuading some manufacturers to let you know what's going on inside is a task in itself.

No-one wants to help you because they disapprove or it's their living. You've hardly said "help me," before they run out a list of excuses and grumblings about qualified personnel and invalidated warranties. There's no simple way, but I'm sure with a little application (and a lot of phone calls) you can do it.

After you have the tech manual (and it's not always an easy book to get), it's an idea to try and learn what all the different components can do and a bit about the history of computing and the theories of logic and calculation that lie behind the keyboard.

SECOND-HAND?

If you're lucky you'll have a couple of second-hand bookshops close by. While these aren't much help for machine specific information, there are generally a few

books on the shelves about the theory of things. It's easy to look at the chips in your computer and ignore them as 'complicated circuits' but the only thing that differs between the microchip and the traditional circuit is scale. Inside the black plastic body of a chip there is nothing more complicated than a transistor and if you can learn how basic transistors, switches, diodes and capacitors work, you will be a long way towards understanding microchips.

A book picked up from the junk box of our local bookshop for 20 pence entitled *Electric Currents and Circuits* has been the basis of all my articles on how basic components function. Three text books long discarded by an HND student have offered me practical solutions, ideas and most of all help. These volumes cost me the princely sum of £2.25 for the lot.

MACHINE SPECIFIC

Computer shops and radio rallies proved a useful source of manuals for obsolete kit. Paragraph one of Murphy's Law requires that whenever a piece of equipment is sold, borrowed or given away, all of the relevant documents must be removed and hidden. Paragraphs two and three of the said law require that the person purchasing the equipment knows nothing about it and knows no-one else with any knowledge.

Thus the manuals and documents are passed around bookshops, boot sales and radio rallies until they surface, dog eared and mildewed several months later.

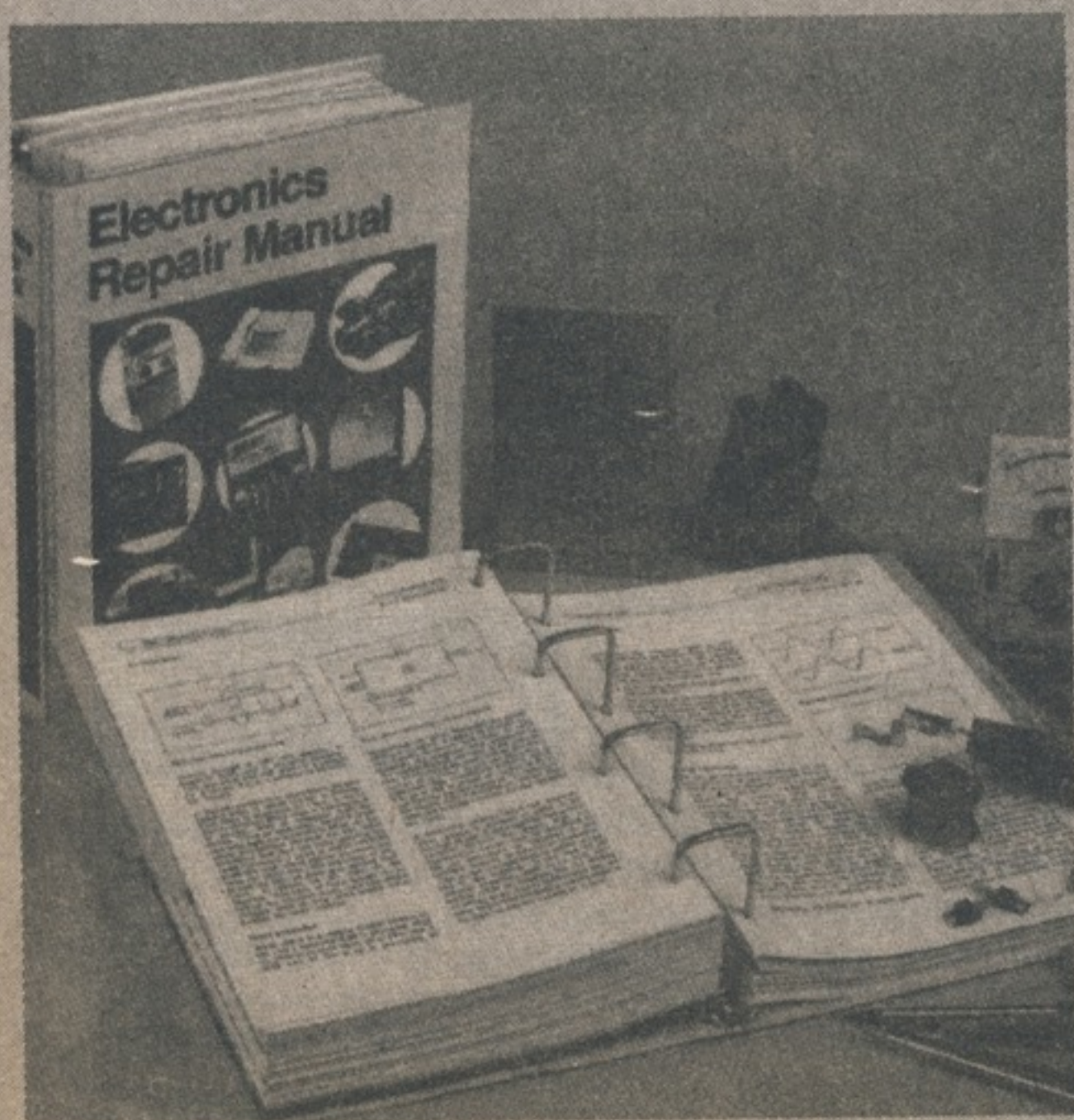
Another focal point for manuals, etc, is the regular All Formats Computer Fair at the Horticultural Halls in London. I've found several useful machine specific books and manuals at the All Formats including a manual for an obsolete IBM line printer, a full technical reference for an Osborne (and the Osborne to go with it) and even a schematic for a modem that had been on the shelf for two years because we had no information on it. ■

ALL IN ONE

Another solution to the knowledge problem is the *Electronics Repair Manual*. This is a weighty volume that tips the scales at £44.95, but is well worth the cash if you want to delve into anything electronic. It is a large format loose leaf binder with over 800 pages including checklists, troubleshooting, supply information, data, basic principles and most importantly, safety.

The loose leaf format means that it will lie flat on the bench. More importantly, the publisher uses this loose leaf format to allow updates by either replacing sections or adding to them. The supplements come in at at least 160 pages and are billed at £22 plus post and packaging.

The *Electronics Repair Manual* is available from WEKA on 071-388 8400. For a full depth review of its 800 plus pages keep your eyeballs welded to Circuit City.



A GOOD READ

Instead of searching endlessly through rows and rows of book shelves – a much easier way to find the books you want is to use the Dewey Decimal System. Most public and many academic libraries categorise their books using this system – each subject and its divisions have a classification number and these numbers are further sub-divided by a decimal point (hence the name). Most libraries put the classification number on the spine of the books and somewhere on the appropriate bookshelves. For example, the *Fax User's Guide* is in category 621.385.

The 600s are technology (applied science) and section 621 is applied physics. Not perhaps the first place that you'd look for a book on fax machines, but as you peruse the Dewey list, you'll find clues to the whereabouts of books that you'd never have guessed.

Categories 004 and 005 in the general section are computer science/data processing and computer programming respectively. It's worth asking the librarian for a photocopy of the Dewey classification list in order to enable you to do a bit of digging on your own.

USEFUL NUMBERS

Here are a few Dewey numbers you may find useful in the public library. It isn't a complete or comprehensive list but it's a start.

003	Systems
004	Data processing, Computer science
005	Computer programming, Programs, Data
006	Special computer methods
016	Dictionary catalogues
118	Force and energy
119	Number and quantity
160	Logic
161	Induction
162	Deduction
167	Hypotheses
168	Argument and persuasion
330	Economics
345	Criminal law
346	Private law
384	Communications, Telecommunications
389	Standardisation
510	Mathematics
530	Physics
537	Electricity and electronics
538	Magnetism
600	Technology (applied sciences)
620	Engineering & allied operations
650	Management and office services

The Complete Systems Company

Hyundai Personal Computers

Super 286X

80286 Processor 8/12Mhz
1Mb RAM
40Mb 28ms Hard disc drive
3.5" 1.44Mb Floppy disc drive
102 Key keyboard
Serial and parallel ports
4 Expansion slots
16-Bit 800x600 VGA card
14" Colour VGA monitor
MS-DOS 3.3 & GW BASIC

£895.00

Super 386C

80386 Processor 8/20Mhz
1Mb RAM
40Mb 28ms Hard disc drive
5.25" 1.2Mb Floppy disc drive
102 Key keyboard
Serial and parallel ports
6 Expansion slots
16-Bit 800x600 VGA card
14" Colour VGA monitor
MS-DOS 4.01 & GW BASIC

£1395.00

Trust 386-33 VGA Big Tower £1799.00

80386 33Mhz; 2Mb RAM; 64KB Cache memory (Max 128KB); 1.44Mb 3.5" FDD; 40Mb 28ms Hard drive; 102 Key keyboard; 16-bit 512K VGA card; VGA colour monitor; 7 Expansion slots (1 8-bit & 6 16-bit); 1 serial 1 parallel.

Trust 486-253 VGA Big Tower £3795.00

80486 25Mhz; 4Mb RAM; 8 Expansion slots (2 8-bit & 6 16-bit); 1.44Mb 3.5" FDD; 210Mb SCSI hard drive; 1 serial 2 parallel; 102 Key keyboard; 16-bit 1Mb VGA card; VGA colour monitor.

Hewlett Packard DeskJet 500 £499.00

Inkjet printer; virtually silent; HP LaserJet Compatible; 300 dpi graphics; several fonts; automatic kerning; superb quality - almost as good as a laser; range of font cartridges available; 3 year warranty.

Citizen Printers

All Citizen printers come with a full 2 year Parts and Labour Warranty.

120D+ (Parallel) **£145.00**

120D+ (Serial) **£159.00**

Both versions have: 120cps draft; 25cps NLQ; 2 NLQ fonts; 4K buffer; IBM & Epson emulations; Both friction feed and pull tractor; 80 columns.

124D (Parallel) **£215.00**

80 column; 24 pin; 120cps draft; 40cps NLQ; 2 NLQ fonts; 8K buffer; Epson & IBM emulations; Partial NEC emulation; Paper park; Short tear off; Easy-use control panel.

Swift 9 pin **£188.00**

3 NLQ fonts; Speeds up to 213cps; Paper parking & short tear off; Epson & IBM emulations.

Swift 24 pin **£289.00**

192cps draft; 64cps NLQ; 360dpi graphics resolution; Full paper parking; LCD control panel - no dip switches needed; 4 Macros; Epson, IBM & NEC emulations; Font cards available; Push/pull tractor; Colour option.

We carry a wide range of equipment, all at competitive prices. If you cannot see your needs here or for friendly and impartial advice on your new Computer System please telephone. All prices are exclusive of VAT. Carriage charged at cost.

Unit 13 Stourdale Road

Cradley Heath

Warley

Portersfield Industrial Estate

West Midlands

B64 7BG

Telephone 0384 67885

Facsimile 0384 62139

WHOLE WIRED WORLD

A Wordperfect upgrade, a cheap answer to PostScript and much more from our man across the Atlantic, Steve Gold.

WORDPERFECT 4.1 UPDATE

Another new edition of *WordPerfect 4.1* for the Atari ST has begun shipping in the US. This latest version, with file dates of the 6 December, has several enhancements over and above the earlier, 1 November 1990, update.

According to Mike Squire of the *ST Report* newsletter, the new version is well-behaved with a wide variety of mouse and screen accelerators, so the package should work with the Mega STE series, as well as the TT030 machines. WordPerfect, in fact, says that the new update is guaranteed compatible with the TT030 machines. *ST Report* is more cautious, probably because there are so many varieties of the TT030 in circulation.

The key features of the 6 December update are that the initial colour palette resembles that of the GEM Desktop, and if colours are changed within the *WordPerfect* environment, the colour combo is retained for future sessions. When the package is exited, the GEM Desktop's colour palette is unaffected by the changes.

While WordPerfect is emphasising the update's included support for the TT030 series, *ST Report* notes that this new version is infinitely less buggy than the 1 November edition.

OK. Now for the bad news. Even if you upgraded to Version 4.1 with the 1 November 1990 edition, you'll still have to pay \$15.50 plus shipping for the new version. But with around \$10 to add for airmail postage and packing, that's not too bad.

Strictly speaking, UK users of *WordPerfect* should contact the company's UK office. While yours truly has found the UK staff efficient, even I doubt that the 6 December edition of *WordPerfect 4.1* is available from the UK

offices, so I'd advise interested readers to contact WordPerfect US direct with their credit cards at the ready.

Contact: WordPerfect Corporation Atari Products Division, PO Box 731, Orem, UT 84059-0731, United States. Tel: 0101-801-225-5000.

BUDGET TIMEBASE CORRECTOR

One of the biggest problems with video editing systems on the Amiga and even PC-compatible machines is that the video signals need some form of time-base correction to stop the images jittering. This is why video editing sys-

tems, even on the Amiga, end up costing well into five figures (and that's dollars and not pounds).

Until now, that is. Digital Processing Systems (DPS) of Scarborough, Ontario in Canada, has come up with a Personal Time Base Corrector which can be used with the Amiga and PC compatible machines.

The Personal TBC system consists of a PC-style card that fits the Amiga (without the need for a PC bridgeboard) or a PC compatible computer. The \$995 system is designed to be compatible with Newtek's Video Toaster system as well as the majority of other video editing systems for the Amiga and the PC.

The system works with both PAL and NTSC video signals being fed into a personal TDC card and then into the video editing software environment. Up to four cards – and therefore video sources – can be used with each PC or Amiga, and DPS reckons the results are of a broadcastable standard. Genlock capability is also supported as standard.

Contact: Digital Processing Systems, 55 Nugget Avenue, Scarborough, Ontario M1S 3L1, Canada. Tel: 0101-416-745-8090 Fax: 0101-416-754-7046

ULTRAScript FOR ST DUE SOON

UltraScript is the name of a new page description language (PDL) that is very close to PostScript, yet is a whole lot cheaper to license. The software of the same name – due out later this year for the Atari ST – is a joint development between QMS/Imagen and Atari, with Atari handling the marketing.

The full version of UltraScript is scheduled for shipment in the third quarter of this year. According to the *ST Report Confidential* newsletter, the software operates as a terminate and stay

resident (TSR) package that intercepts printer calls from most DTP software on the ST, routing it through the necessary printer drivers to achieve the necessary graphics and fonts.

What's most attractive about UltraScript is that its able to convert pure UltraScript print commands and route them out of the ST as PostScript commands. This means that DTP systems based on UltraScript can drive PostScript-compatible laser printers without the need for an expensive PostScript license! Watch this space.

AMIGA 3000UX ARRIVES

After several months of waiting, Commodore's Amiga 3000UX Unix workstation is now shipping. At least, that's the word from the company's US headquarters. The machine runs AT&T's Unix System V Release 4 operating system and is based on a standard 16MHz 68030 Amiga 3000 chassis.

Two versions of the machine are available in the US, the Model UB with 4Mb of RAM plus 100Mb hard drive at \$5,499; and the Model D with 8Mb of RAM and a 200Mb hard drive at \$6,999.

Both models can be expanded to 18Mb on the motherboard and feature an Ethernet board, Unix system software, mouse and a single 3.5 inch floppy drive as standard within the above prices.

What's interesting is that Commodore is claiming that the 3.5 inch floppy drive is multi-format. From that I'd guess that the drive will read and write to pretty well any 3.5 inch disk format – maybe even Apple Mac disks.

Contact: Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380, United States. Tel: 0101-215-431-9100 Fax: 0101-215-431-9156. ■

PORTFOLIO PROGRAMS A-GO-GO

Since Atari US shuffled its pricing on the Portfolio at Comdex Fall last November, sales of the machine have gone through the roof, with the predictable result that there has been an explosion in the amount of software developed for the machine.

Gregg Pratt over at Atari US is co-ordinating a lot of the packages for the tiny PC. His list of available packages is growing almost daily, so it's worth dropping him a line or a fax to enquire about specific packages.

In the meantime, here's a short list culled from the Atari Portfolio forum on Compuserve:

POWER BASIC (Spectra Publishing) is a full-fledged powerful BASIC compiler that allows users to write application programs for the Portfolio that can be tailored for specific needs.

PORTFOLIO STOCK TRACKER (Lifestyle Software) keeps track of user's stocks and shares. The program supports hard copy printout.

ATARI TURBO TRANSLATOR (Organised Solutions) translates approximately 1,000 phrases and 2,000 words into six languages (English, Swedish, German, Italian, Spanish and French).

PERSONAL FINANCE (Bytesize Software) is an easy-to-use tracking program that allows input and sorting by category. This software package can also be used to record time/expenses for anyone who has to maintain an hourly time sheet for billing purposes.

SCIENTIFIC CALCULATOR (Atari) contains approximate scientific transcendental functions so that users no longer need to carry a scientific calculator in addition to their organiser.

PORTFOLIO BRIDGE BARON (Lifestyle Software) is for people who want to learn how to play Bridge or improve their game strategy. It includes 91 challenging deals as well as a variety of both elementary and advanced declarer strategies.

PORTFOLIO WINE COMPANION (Lifestyle Software) allows users to catalogue their wines, choose just the right wine for the occasion and keep track of their wine cellar value and composition.

PORTFOLIO ASTROLOGER (Lifestyle Software) uses the three main astrological calculation bases (Placidus, Koch, and Equal House) to provide a complete natal chart, influences, a planetary map, daily data and even the interpretation of the data. The program allows for hardcopy printout.

Further details from: Greg Pratt, General Manager, Atari Computer, 1196 Borregas Avenue, Sunnyvale, CA 94088, United States. Tel: 0101-408-745-2000 Fax: 0101-408-745-2988.

● If you're on-line, the Atari Portfolio forum on Compuserve has to be the source of public domain and shareware software for the pocket PC. The forum has more than 2,000 members, meaning that the £7.00 an hour off-peak it costs to access Compuserve's direct dial port in London is well worth the money. Tel 0800 289458.



SOUNDTRAP 3 AUDIO SAMPLER

1. HIGHEST QUALITY
2. SMALLEST ON THE MARKET
3. FITS A1000 OR A500/2000
4. PRINTER PASS-THRU
5. GAIN CONTROL
6. SOFTWARE, SCREWDRIVER & LEAD INCLUDED.
7. COMPREHENSIVE MANUAL

Unless otherwise stated, all our products carry a 12 months warranty, plus Omega Projects prided UNLIMITED SUPPORT

MINI-MIDI INTERFACE + ---SOFTWARE---

1. HIGHEST QUALITY
2. SMALLEST ON THE MARKET
3. FITS A500/2000/1000**
4. DATA INDICATORS FITTED
5. 2 METRES CABLE BUILT IN
6. FULLY OPTO-ISOLATED
7. TRIED & TESTED DESIGN

**A1000 requires special adaptor



A500 replacement int. drive.....	£54.95
A2000 internal drives.....	£59.95
A3000 internal drives.....	£59.95
45Meg SCSI 3.5" hard drives.....	£239.95
90Meg SCSI 3.5" hard drives.....	£349.95
136Meg SCSI 3.5" hard drives.....	£475.95
182Meg SCSI 3.5" hard drives.....	£535.95
A590 CMOS RAM chips (512K).....	£25.00
B2000 18 pin DRAMS (2Meg).....	£109.95
256*1 DRAMS 150nS.....	£1.25
1.3 ROMS.....	£34.95
68000 chip (8MHz).....	£12.95
68000 chip (14MHz switchable).....	£39.95
68010 chip.....	£24.95
68020 chip (20MHz).....	£79.95
68030 chip (25MHz).....	£195.95
68030 chip (33MHz).....	£275.95
68881 co-pro (12MHz).....	£49.95
68881 co-pro (16MHz).....	£54.95
68881 co-pro (20MHz).....	£75.95
68882 co-pro (20MHz).....	£99.95
68882 co-pro (25MHz).....	£149.95
68882 co-pro (33MHz).....	£179.95
68882 co-pro (50MHz).....	£399.95
A3000 RAM 256*4 80ns 1Meg.....	£65.95
A3000 RAM 1024*4 80ns 4Meg.....	£299.95

512K with clock + switch.....	£32.95
IN500 with 1.5Meg installed.....	£99.95
SIN500 OK.....	£85.95
SIN500 with 2Meg installed.....	£175.95
X-RAM OK (for A500/1000).....	£175.95
X-RAM with 2Meg installed.....	£279.95
X-RAM with 8Meg installed.....	£529.95
Octabyte OK (for B2000).....	£140.95
Octabyte with 2Meg installed.....	£249.95
Octabyte with 8Meg installed.....	£499.95
Inmate OK + SCSI + 68881 Soc.....	£284.95
Inmate + 2Meg + SCSI + 68881 Soc.....	£350.95
4 channel audio mixer + mic.....	£34.95
Sound Trap 3 + Mini-Midi.....	£47.50
Sound Trap 3 + Audiomaster 2.....	£54.95
Sound Trap 3 + Audiomaster 3.....	£84.95
Mini-Midi + Music-X.....	£94.95
Audiomaster 2.....	£29.95
Audiomaster 3.....	£54.95
X-Copy Professional v3.1.....	£32.95
Byte 'n' Back (h/disk backup).....	£19.95
1081 RGB monitor.....	£187.95
3.5" ext. drive + on/off switch.....	£59.95
3.5" ext. + track counter.....	£88.49
A590 hard disk OK.....	£299.95
A590 hard disk 2Meg.....	£354.95

Accelerator cards.....	from £399.95 (call)
68030 25MHz OK (A500/2000/1000).....	£479.95
68030 + 1Meg + 25MHz 68882 co-pro.....	£629.95
68030 + 1Meg + 33MHz 68882 co-pro.....	£659.95
68030 + 1Meg + 50MHz 68882 co-pro.....	£879.95
68030 33MHz OK.....	£579.95
68030 + 1Meg + 25MHz 68882 co-pro.....	£729.95
68030 + 1Meg + 33MHz 68882 co-pro.....	£759.95
68030 + 1Meg + 50MHz 68882 co-pro.....	£979.95
2Meg 32-bit fast RAM for above.....	£259.95
4Meg 32-bit fast RAM for above.....	£454.95
8Meg 32-bit fast RAM for above.....	£799.95
512K of static RAM (Shadows Kickstart).....	£99.95
Amiga 500 Screen Gems Pack.....	£379.95
At-once card (PC/AT Emulator).....	£195.95
5.25" ext. disk drive (40/80 TRK).....	£109.95

OMEGA PROJECTS

14 DERWENT CLOSE
CULCHETH, WARRINGTON,
CHESHIRE, ENGLAND,
WA3 5DY

23way connector no hood.....	£1.99
23way connector + hood.....	£1.49
X-Copy hardware.....	only £9.95
3.5" blank disks.....	0.49
10 capacity disk boxes.....	£1.50
40 capacity disk boxes.....	£4.50
80 capacity disk boxes.....	£4.95
Dynamic microphones.....	£9.95
Condenser microphones.....	£14.95
Pair Hinari speakers.....	£19.95
Pair Panasonic speakers.....	£29.95
Joystick extension lead.....	£2.50
1.2 metre midi leads pair.....	£2.95
3 metre midi leads pair.....	£3.95
5 metre midi leads pair.....	£4.95

ALL CHEQUES,
P.O.'s etc should be
made payable to
OMEGA PROJECTS

We also take
Access,
Visa,
Mastercard
& Eurocard

1/2 MHz A500
RAM upgrade 512K
WITH CLOCK & SWITCH

£24.95

12 MONTH WARRANTY

FATTER AGNUS CHIPS
NOW IN STOCK AT ONLY

£59.95

WHILE STOCKS LAST



GENUINE CBM
A1010 EXT. DRIVE

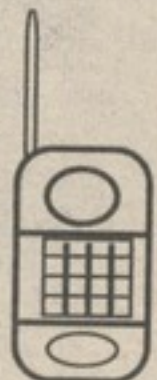
£49.95

WHILE STOCKS LAST



0925-763946

FOR ORDERS & TECHNICAL QUERIES



0860-795260

IF WE ARE OUT OF THE OFFICE

0204-884230
FOR ORDERS ONLY

ALL PRICES INCLUDE VAT



ROUTE PLANNER
FOR THE AMIGA

GBRoute

£39.95

NEW

TECH TIPS



Having problems with you circuits? Bought a new computer and not sure what's the best software to use? Do you have any brilliant ideas for other Tech Tips readers? Send your stories and queries to Tech Tips, New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

■ HELP! Eight score draws

I have just started BASIC programming and have written a very simple program to provide me with 11 random numbers for a pools coupon. I would like to be able to sort the numbers into ascending order for ease of entry and have read of various sorts, eg, bubble and shell – however I cannot successfully write any sort into my program. I would be obliged if you could help please. Could you also please tell me if there is a short program to obtain 11 different numbers in the range 1 – 58? Mine does seem rather long-winded.

Trevor Cobbe, Leicester

I'm not falling into the trap that you've set me. The last time that I dusted off my programmers hat to answer a query, several better/faster/more elegant solutions landed in the Tech Tip mailbag. I will however risk starting a 'my favourite programming language is better than your favourite programming language' debate by throwing the challenge to all our codeheads. So there you have it. Go forth and may the source be with you. (Groan – Ed)

■ STAR LETTER! But no prize

Here is some help for George Garven, Ayrshire whose problem you entitled. BAH! Silly boy. There are always a couple

of good reasons for having a TV/monitor.

1) It's the only type of monitor you possess, and you will be surprised at the quality of the display in all modes except for interlace.

2) It's the only TV you possess that gives better quality than a modulator. The problem occurs when a member of your family wants to watch *Home and Away*, *Neighbours*, etc. This means you have to close all applications and save work 20 minutes before these programs come on, because the computer automatically takes over the TV set when switched on, thereby not allowing the composite picture or sound through no matter which channel is selected.

The problem is the Euro connector. If the source ie, Amiga/videos supplies the switch over signals the set is automatically put in monitor mode. To stop this from happening, open up the connecting cable at the 23-pin connector Amiga side, locate pin 22 and pin 23 – these should be clearly marked. As it is these pins that supply the source signal for the automatic changeover they have to be desoldered and cut back or capped so they do not touch each other or anything else. Once this is done you can reassemble the connector, plug in and switch on.

You can now select between monitor or TV sure saves powering everything

down every time someone wants a look at the teletext to see if his gee gee fell in the last race. *New Computer Express* is great, good work men. (Don't forget us wimmin – sub)

V. Keizars, Edinburgh

The thought of allowing anyone to interrupt a session on the Amiga to view antipodean dross where the music is only one step up from a Z81 is enough to drive anyone to distraction.

Honestly, I've seen animation programs on the Amstrad CPC with more realistic movement than the acting on Australian soaps. Still, there's no accounting for taste and with the current climate, I have to admit that it's not a bad idea being able to flick to a TV for the latest news reports. Thanks for your input on the subject. If I was a sadist, I'd send you a video of *Prisoner Cell Block H* for the week's star letter but I'm not so I won't.

■ TIP! Spectstrad monitor

I recently purchased an Amstrad CTM664 monitor (the one that comes with the CPC6128) in the January sales for only £20 with the express purpose in mind of converting it to work with a 128K Spectrum. I have now completed this relatively simple conversion and thought that the informa-

tion I had gathered to complete the conversion may be useful to your readers.

The simplest conversion is for owners of Plus 3 and Plus 2 Spectrums, and consists of an adaptor lead to fit between the spectrums RGB/Peritel socket and the monitors input lead. You will need an 8-pin male 180 degree DIN plug (for the spectrum end) and a 6-pin female 240 degree in-line socket (for the monitor end). Both of these are easily available from Tandy.

Five connections need to be made between the plug and the socket. It is best to use four core screened cable, and use the screen to connect between pins two and five. The earlier Sinclair black cased 128K Spectrum uses a separate bright line which is not accepted by the monitor. It is however possible to combine the bright signal with the red, green and blue signals so that the colours are displayed correctly.

The modification can be included in the adaptor cable between the Spectrum and the monitor and consists of three small signal diodes (IN4148 or similar), and three 75 ohm resistors. Each diode needs to be paired with a resistor, with the end of the diode marked with a ring on the far side from the resistor. Connect the diode end of all three pairs to the bright output from the computer (pin three), and connect the loose resistor ends of the pairs to the red, green and blue outputs (pins six, seven and eight). The diodes must be the right way round for the modification to work, but the orientation of the resistors is not important.

As the CTM664 monitor does not have any sound output a separate amplifier will be needed to hear the 128K's sound. I used the Tandy mini amplifier/speaker (£10) connected to the Spectrum's tape/sound socket. It is also possible to use the monitors redundant power supply line to power the amplifier.

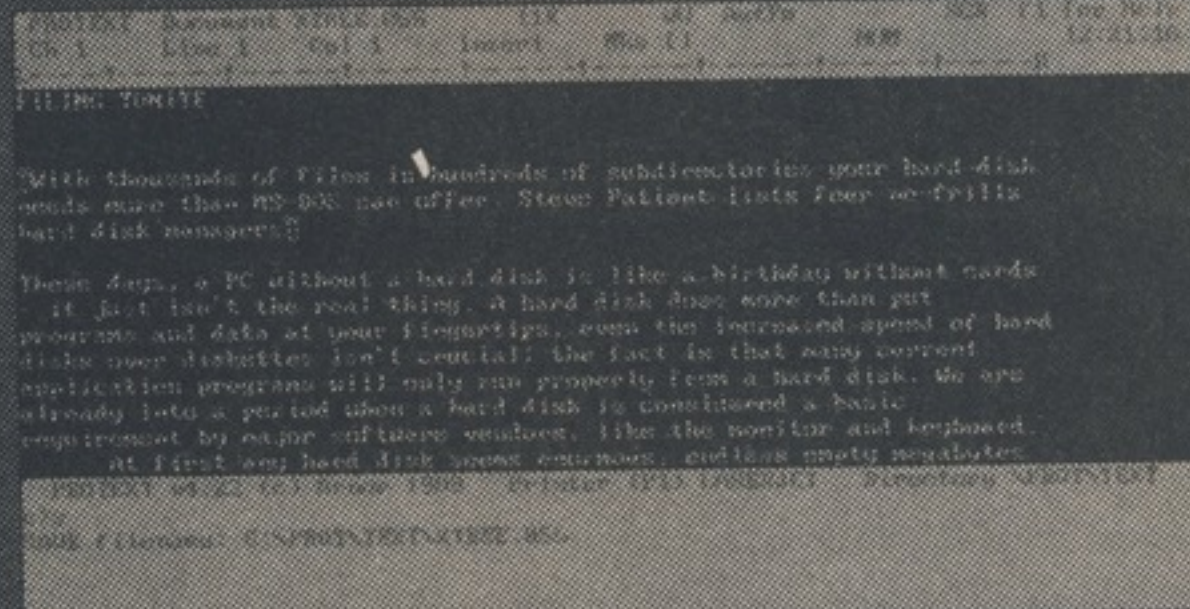
David Smith, Sunderland

■ HELP! Word processing package

I am searching for a word processing package that would most closely match my requirements and wonder if you could make any useful suggestions, as I am unable to ascertain the information from your WP shopping guide or from advertisements; nor do I wish to be lumbered with a large phone bill making enquiries on various items. Using an Atari 520STE, my requirements would include proportional spacing facility, the ability to call up multiple font styles and sizes from the screen (these being displayed as they would be printed), a spelling checker and if possible (although not essential), a thesaurus. I would also seek the ability to switch off automatic page numbering. Furthermore, this would hopefully fit within an £80 budget. Would I need to expand the memory to cope with such a requirement?

I. Spake, Feltham, Middx.

I'm not sure that your requirements can be matched within your price range. I'd have thought that the closest that you'd come to your ideal wordprocessor would be *Protext* 4 from Arnor at around £100. This supports proportional printing, has



• Protext – an ideal word processor.

a good quick spelling checker and is used professionally by several of the mags here at Future (*Amstrad Action*, *Amiga Format*, *ST Format*, *8000 Plus*, *PC Plus*, and *Classic CD* to name but a few). The sort of features you are asking are more the realm of the document processor or DTP than a simple word processor. Shop around and keep an eye on the pages of Shopping Express but I think you could do a lot worse than to settle for *Protext*.

Yet another use for the Amstrad monitor. We had one in the office attached to an Amiga, a colleague swears by it for his STE and I'm told that they even do quite a good job when attached to an Amstrad CPC.

■ HELP! Germany calling

I am at Grimsby College of Technology and Arts, and currently a computer student. One of my core subjects is European

Studies for which I must write a thesis on telecommunications within Germany. I appreciate your time is very precious and would be most grateful for any information you could provide.

Mr. Siu Yee Lo, Grimsby

As a computer student you will be aware of the value of modem communications as a way of gathering information. I wouldn't suggest that you pop the phone bill up by ringing the fatherland but if you scan the Express On-Line lists you should be able to find a local BBS with some sort of echo mail that passes and collects messages to and from Germany. A couple of well placed messages in the net mail boxes could bring you a wealth of first hand information on your chosen subject.

If you haven't access to some sort of communications equipment, you could always leave a message in the reader ads (using the form provided) and hope that one of our benevolent readers can help out.

■ HELP! Typing errors

Having bought an Amstrad PCW8256 about 12 months ago and also at the same time became a regular reader of *8000 Plus* I started to do one or two of its listing programs. Not having success with them, due to my incompetence with my computer or so I thought until I tried the listing in the December issue. Having tried to get it in my computer half a dozen times I finally took it to my nephew only to find he has the same sort of problem, also his chums as well. This convinced me that I was not at fault, but the listing must be.

When I have put all the data in the computer and completed all the instructions, and ready for the final test, which is simply to type prompt, nothing happens.

The keyboard freezes, none of the keys function. Other friends have their screen fill from top to bottom with the list of prompts. So could you please help? I would be most obliged.

By the way I have another problem, I bet your saying under your breath, "got a right one here", but please have patience with an old man. The two master disks that come with the Amstrad PCW, both have DIR. I can get them on the screen, but how do you get them to work on individual files? It's the same with say, public domain - I just can't get them to work.

Mr LW Garner, Kings Norton, Birmingham

I asked my colleagues on *8000 Plus* and as well as assuring me that all of the offending programs were in fact faultless, they offered to run them to prove it.

That being the case, I'm afraid that it's your typing (and that of those around you) that is at fault. Go through the listings with a fine tooth-comb and look out for ls where there should be 1s, Os where there should be 0s and other errors of punctuation and letter juxtaposition.

To persuade a program to run, first load CP/M. when you have the a> prompt on the screen, put the disk containing the program that you want to run in Drive A. Type dir and you will get a list of the files on that disk. At the A> prompt, type the name of the file that you wish to run, bearing in mind that it should have an extension of .COM or .SUB (For example PROTEXT.COM or TIMSMITH.SUB).

■ Help! 64 driver

I have recently purchased a Commodore 1351 mouse and OCP *Art Studio* for my Commodore 64. I have a Commodore 1526

printer for which a driver has to be set up for before I can print out pictures. I don't know where to start. The computer asks a series of questions about the printer in order to set up a correct driver. I don't know a lot of the answers needed. I wrote a letter to Commodore asking them for help, they replied twice, but both sets of answers varied slightly and both sets didn't work. Please help! I am desperately in need of these answers as I need to be able to print out hi-res graphics for a CAD project I am doing at school. I have enclosed the print configuration questions and listing (if it helps) and hope someone on this planet can help me

Christopher Warrington, Worksop

I'm as puzzled as you on that one. If the instructions from Commodore don't work and you've tried every possibility and double checked your implementation of the instructions, the only thing left to do is hope that some kind reader of Tech Tips can help you out. In the mean time check out the list of user groups in Express on Line. there could be someone there ready to help you.

■ HELP! Amiga keymap

A plea from a desperate Amiga man - my A500 keyboard is a normal QWERTY keymap but on using shift and the number two for the quote marks it prints @, also using shift and the number three for a pound sign it gives a \$ sign.

On phoning the firm which supplied my computer they told me I could change the keymap using the Workbench. After following the instructions given exactly, nothing happened. After numerous phone calls I was told I had the American workbench disk and to send it back to be exchanged for an international Workbench. I did. After more phone calls

and a wait of three weeks I got the international disk back. I went through the complete instructions again. Nothing happened. I still have a keyboard which prints in the American style. I have read and reread the manuals in case I may have missed something out, but I cannot see anything. I get the keymap icon up, then scan menu and get info. I then press select button on Add, then select the string symbol, I then print "keymap" gb press return and then select save. I then double click on the keymap icon. Please, please any help or advice would be really appreciated.

John Carr, Salcombe, Devon

In order to make the permanent change to your disk so that it defaults to the UK keymap, you'll have to edit the startup sequence. First copy the Workbench disk and only edit the copy. This way if you make a mistake, you will be able to make another copy to start again.

The instructions on how to copy a disk are in the manual. Startup sequence is a file that you will find in the system directory. Your problems are being caused by a line in the startup sequence with setmap usa1 in it. The startup sequence should be loaded into a word processor and the offending line edited to change from setmap usa1 to setmap gb. If you haven't got a word processor you can use ED. The instructions for using ED (a very basic text editor) are in the manuals that came with your Amiga. Simply put the yellow cursor over the '1' in usa1 and hit the delete key four times. This will rid you of usa1. Then type gb in its place. Hold down the Control key and hit the X key. This will save your changes and exit from ED. You can now reset the Amiga (with the key sequence Control-Amiga-Amiga) and you should have the GB keymap. ■

■ HELP! Amiga display

I have owned an Amiga A500 now for three years and I was hoping that you could help me with a number of problems.

1) Is it possible to connect a PC VGA monitor to an Amiga without extra circuitry? If so could you please show me how and what I would need. It would not be the first time I have made up leads for the Amiga, ie modem leads.

2) If so does the VGA hold any improvements over the Commodore 1084S or the Philips 8833 range of monitors and if so in what ways?

3) Is it possible to connect a PC hard disk to the Amiga. I have a 32 meg hard disk and would like to fit it up to my Amiga instead of forking out over £300 for the Commodore model. If it is possible please show me how.

I would be most grateful if you could help me. I have searched high and low for answers to these questions.

I have bought NCE from issue one and rate it as the best mag for up-to-date news.

Paul Trouton, Co. Armagh.

It's possible to connect some kinds of VGA monitors to an A500 but it isn't necessarily easy. The sync rate of an Amiga is 15.625KHz whereas many VGA monitors have a sync rate of double that. The only easy way to do the job is if you have a multi-sync VGA monitor that

has the ability to run at the Amiga's sync rate unmodified.

With a multi-sync VGA monitor it should be a simple matter of making a lead. The pin connections for the Amiga 23 way video output is in the user manual and similar information about the VGA monitor should be either in the monitor's manual or available from your supplier.

Using a VGA monitor with an A500 wouldn't really offer you any great advantage over a Philips or Commodore model unless you upgraded to the top level A3000. PC hard drives can be fitted to Amigas, but it isn't an easy job. As well as an in-depth knowledge of hard disks, controllers and SCSI interfaces there could be an extensive hardware modification too. If you can't figure out how to do it on your own, the job's not for you.

The only light at the end of the tunnel comes from a device called Megastor. This is a PC hard drive designed to connect to a PC via the parallel port. Experiments are currently underway to see if it is possible to persuade it to work with a PC under hardware emulation. (ATonce or KCS Power PC Board). Should this be successful it may offer an alternative route to an Amiga hard drive. Watch Circuit City for details.



• High quality colour from a VGA monitor?

A STORM GATHERING



The Sales Curve Ltd continues to strengthen and diversify its operations as 1991 approaches.

The launch of our own label **STORM** and our on-going expansion mean that we are now looking to increase our development capacity.

If you are a programmer/artist on any of the following formats; Atari ST, Amiga, Commodore 64, Spectrum and Amstrad, we want to talk to you.

We're also interested in people who are willing to work on the SEGA, NES and Superfamicom machines.

We're primarily interested in in-house programmers, but for exceptionally talented and experienced people will consider freelancers and third party teams.

For further information contact: Dan Marchant

**THE SALES CURVE
LOMBARD BUSINESS CENTRE
50 LOMBARD ROAD
LONDON
SW11 3SU**

Telephone: 071 585 3308

We offer an excellent salary and bonus scheme - plus the prospect of working for a company that's rapidly becoming a major contender in the Software Entertainment Industry.

Console Programmers & Graphics Artists

Due to expansion BITS require more programmers and graphics artists.

Based in our Wealdstone office, you will be working on the Nintendo consoles (the Gameboy, the NES and the Super Famicom), and the PC Engine.

To be eligible for the programming vacancies, applicants must have a proven track record, with at least 1 game published and preferably experience in 6502, Z80 or 68000.

The graphics artists should have wide experience in the video games industry, working with 8-bit and 16-bit machines.

Successful applicants will be working with PDS, and other powerful tools. BITS only develop console products, including R-Type, Chase HQ and Castelian for the Gameboy, and Castelian and Loopz for the NES, all are/will soon be released in the US and some in the Japanese markets.

All applicants can send their CV's and demos of their work to:

BITS

Winchester House, Canning Road,
Wealdstone, Harrow, Middx. HA3 7SJ

Alternatively you can telephone Foo,
on (081) 427 3836 for more information.

PROGRAMMERS

- * *Work available on console and home computer for all popular formats.*
- * *Original or conversion work.*
- * *Work is available now and also later in the year. Why not secure yourself an advance contract now and avoid losing income between projects?*
- * *We regret that we can only consider applications for freelance work.*
- * *Top rates for experienced programmers.*

Creative Materials is the team behind Rotox, Operation Harrier, Line of Fire, Days of Thunder, Eswat and Welltris.

Apply in writing to:-

**Creative Materials Ltd
Attn: Nick Vincent
28, Church Lane
Prestwich
Manchester
M25 5AJ**

(Please note that under no circumstances can we deal with telephone applications or inquiries).

DO YOU WANT TO BECOME A PROGRAMMER?



Established 1968

Move across to the rewarding world of IT

We have a series of short and long term training programmers in Computing and Information Processing.

- * C & G 424/425 Certificate in applications programming.
- * C & G 418 Computer Programming & Information Processing.
- * Evening courses in DBASE, WP, Spreadsheet Analysis.
- * Evening courses in Pascal, BASIC & COBOL.

**Contact Central London College on
071-580 4596.**

TRAINING FOR YOUR FUTURE

Recursion is usually looked on as an advanced and complicated technique reserved for esoteric problems in Artificial Intelligence – too confusing and irrelevant to the ordinary programmer. Most of this attitude probably stems from the ludicrous definitions often given to the technique; anyone faced with the statement "recursion: see recursion" could reasonably assume that an important tool would not seem so pointless. The other argument against recursion is that it is inefficient.

Recursion is a technique where a function can call a copy of its own code to solve part of the problem that it is working on. If you want to calculate the factorial of a number, you calculate the factorial of the number immediately before, working backwards until you find the base case or termination condition – a number whose factorial you already know. As each calculation follows the same formula, you can use the same code for each number, and then combine the results for the total.

A well-written iterative loop may incur less of an overhead than the embedded calls generated by a recursive function; this is assuming that the loop is well written and that there are no time-wasting mistakes to be repeated each time around the loop. The main advantage of recursive functions is that they are easy to write and understand, and this makes them easy to maintain. For all but the smallest section of code, this is a major consideration and may outweigh questions of efficiency, unless you are really short of memory. Also, recursive functions create their own arguments and variables for each new call, since a new copy of the code is used, so recursion does its own book-keeping.

Anything that you can do using recursion, you can do using iteration, but some things are easier when written recursively. If you consider a simple loop, written as:

```
loop: DO
    instruction1
    instruction2
    ...
    LOOP
```

then you can write this recursively as follows – List is a label given to the list of instructions:

```
List: instruction1
      instruction2
      ...
```

CALL List

The DO loop will be implemented by a jump to the beginning of the loop each time the keyword LOOP is reached – this code actually produces an infinite loop. When the List function is called, control does not jump back to the beginning of the definition of List; instead, a new copy of the code that makes up List is copied to the current program area, so that any variables created within the first instance of List will be created again, in the second copy. This means that all the variables are local; if you want to use a control variable, to keep a tally within the recursion, you will have to pass it from copy to copy as a parameter. If you are using recursion to calculate a final value, you must pass in a parameter to hold the value; this argument will be passed down through the copies until the value is calculated and then passed back up as the recursion 'unwinds'. This means that, like any repeated code, you must include a termination condition – something to tell the program when to stop. This is known as the base case. For each function, you will also need the general recursive case – what the function does every time except the last one –

- Recursion works by calling duplicate copies of the original routine.
- Parameters must be used to pass data in and out, and results must be carried up from the lowest level of recursion.
- If code comes after the recursive call, it will be executed in the last copy of the function first.
- Recursion is best for repetitive problems that can be solved in stages.

RECURSION REVISITED

Mary Branscombe takes you beyond the statement 'recursion: see recursion' and explains the functions of this complicated technique.

and definitions to cover any special cases – if the input data is out of range, for example.

Recursion can be used in most languages; in Prolog and Scheme (Jerry Sussman's version of Lisp), it is the main method of repeating code. Recursion is best used where a problem can be solved by breaking it down into smaller sub-problems. It is excellent for handling hierarchical data, for example that stored in trees. As each point in a tree is either a terminal node or the beginning of another tree, the tree is actually defined by recursion and so recursion is the most natural method for searching through the structure.

SOLVING FACTORIALS

The factorial of a number is the product of all the preceding numbers. The factorial of four, written 4!, is 4x3x2x1, or 24. The factorial of one is one. To calculate this using a recursive function, the algorithm would be:

```
if n<>1 then
    n! = nx(n-1)!
else n! = 1
and the code would look something like this:
factorial(n, result)
m=n-1
IF n<>1 THEN CALL factorial(m, result)
ELSE result = 1
result = resultxn
RETURN
```

The number to be factorised in input in n; if this is one, the function returns one without making any calculations. Otherwise, n is decreased by one to give a value for m and another copy of the code is called to calculate the factorial of this number. If m contains the value one, this copy will return one in result, otherwise it will decrease the value of m again and pass this to another copy of the code. This process continues until m is equal to one; obviously, this does not work for negative numbers. When a copy of the function returns one as the value of result, this is multiplied by the value in n in the copy immediately before the final copy. This calculated value is then returned to the copy before that and multiplied by the value of n stored there, until the original code is reached and the final value calculated.

If the original number is three this will be decreased to two in the first instance of factorial; two is not equal to one and so a copy of factorial is called. The value passed in is two, which is decreased to one, which is multiplied by two, giving two; this result is returned to the previous instance of the code and multiplied by three, to give the final result, six. When implementing this algorithm, you will need to reject negative numbers – as they can't be decreased to one, the recursion will carry on until the machine runs out of memory. You will not be able to calculate the factorial of numbers larger than 15 because the result will be a larger number than

the computer can handle, you should check for this in your code. The program looks like this in C:

```
/*comments
 *recfact.c
 *calculate factorials recursively
 */
#include ,stdio.h>
#include ,stdlib.h>
#define NDIGITS 10
long factorial(short);
int
main(void)
{
    char input[NDIGITS + 1];
    /*buffer for input*/
    short number; /*initial number*/
    long result; /*resulting factorial*/
    /*get input from the user*/
    printf("Type a non-negative integer
    and press return");
    gets(input);
    number = (short) atoi(input);
    /*calculate and print the factorial*/
    result = factorial(number);
    printf("The factorial of %hd is %ld\n",
    number, result);
    return EXIT_SUCCESS;
}
long
factorial(short n)
/*recursive factorial calculation)
{
    if (n <= 1)
        return 1L;
    else
        return (n*factorial(n-1));
}
```

The main() function sets up a character array as a buffer and gets the input from the user. This will be given as a character, so atoi is a library function used to convert it into a number. The value of this is stored in number and passed to factorial. If the argument is less than or equal to one, one is returned – 1L indicates that this is a long integer. The return type has been set as a long integer to handle the large numbers generated as factorials and all results must be in this form. If the argument is greater than one, factorial calls itself with an argument of one less than the argument it received, and so on until the argument is reduced to one. When this happens, all the functions return one after the other, returning the final value to main().

This code does not reject numbers above 12; try modifying it to do so. If you do not program in C, try the algorithm in a language you do use. Remember there must be a point at which the recursion bottoms out. ■

**FREE MOUSE
WITH EVERY
SYSTEM**

M&S SOFTWARE

386 SX 20MHz Colour Super VGA

40 Meg hard drive, 1 Meg of RAM, 1.2 or 1.44 floppy drive, 102 key keyboard, colour super VGA monitor with orchid SVGA card, 2 serial, 1 parallel port and 1 years on-site maintenance.

ONLY £999.00

+ VAT + £15 Delivery

As above 386 - 33 MHz £1299.00

+ VAT + delivery

As above 486 - 25 MHz £1699.00

+ VAT + delivery

TEL: 0993 868171



All credit cards accepted



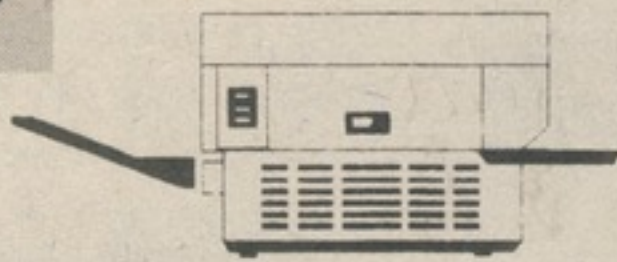
M&S SOFTWARE

Special Clearance Offers!!

ACER LP76 LASER

(HP laserjet II emulation)

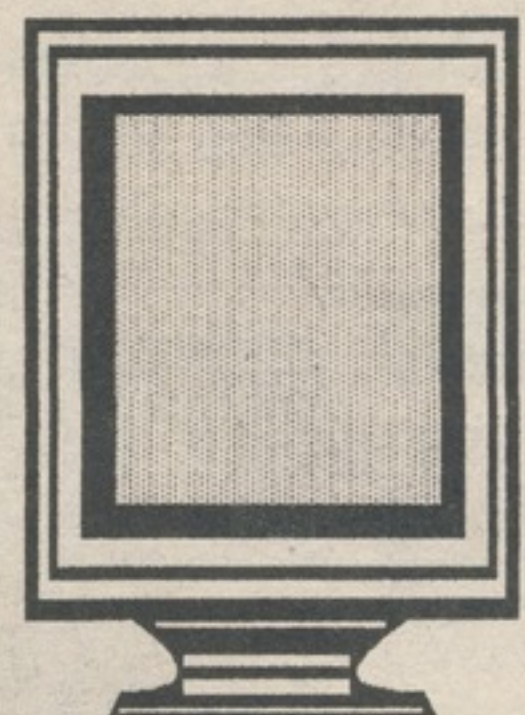
£549



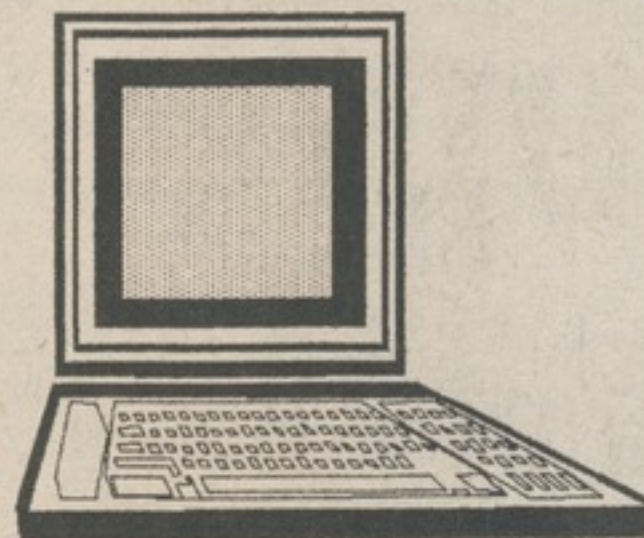
- ** 6 pages per minute
- ** 300 x 300 dpi, 6 fonts
- ** Auxiliary paper tray
- ** 512k memory, expandable to 4.5Mb

15" MONO VGA MONITORS

Super/high
resolution
(1280 x 800)
for DTP &
CAD



with video card
ONLY £399



Goupil Golf 386SX Portable

- ** 1Mb expandable RAM (to 9Mb)
- ** 40Mb hard drive
- ** Two 8 bit expansion slots
- ** VGA display
- ** Serial and parallel ports
- ** 10" backlit

OUR PRICE - £1199



286-16MHz with Colour VGA

- ** 3.5 or 5.25 floppy drive
- ** 40Mb hard drive
- ** MSDOS 3.3
- ** Includes keyboard and FREE mouse
- **FREE windows

M&S PRICE: £899

SOFTWARE

WINDOWS 286, V2.11 £19.99

WINDOWS 386, V2.11 £29.99

BESPOKE PACKAGES - PLEASE ENQUIRE



For further information

CALL NOW

0993-868171

(Monday - Saturday 0830 -1830)

All major credit cards accepted

Prices exclude VAT and delivery

**FREE on-site maintenance with
all orders placed before
the end of February**

**STE Soundtracker • STE
• The Demo Club**

STE owners know that they have a technically far superior machine to its ancestor the ST, especially as regards its sound capabilities. And yet little has ever been written specifically for the machine.

The *STE Soundtracker* goes one step towards changing all that. It allows you to play those samples in glorious stereo that previously have been only available to Amiga owners. The quality of the music is truly astounding, and what's more, a total of thirty music disks translated across from the Amiga are being prepared.

So if you have an STE, and feel like giving it, and yourself, a treat, then this

THE PD COLUMN

MC Adam 'Bad' Waring gives you the low down on sampling and rapping on your ST, some crucial clip art for the Amiga and a pair of well wicked games.

may just be the program for which you've been looking.

**Rrap • ST • Trust PD
• DEM124**

Fancy yourself as a bit of a DJ but you don't want to swap your computer for a twin deck? Then you can cut into the

groove with *Rrap*, the do-it-yourself rapping kit for the ST.

In essence it plays back preprogrammed samples. The fun bit is that by simply pressing a key a sample replays itself rapidly and repeatedly thus forming the basis of a backing track. There are a number of samples built in, mainly taken

from digitised speech samples from demos, and short, repetitive tunes. These are selected with the mouse so you can quite quickly become a proficient rapmaster just by pointing and clicking.

And that's just about all there is to it! A fairly useless piece of software actu-

Soko ST • ST • Trust PD • GAM44

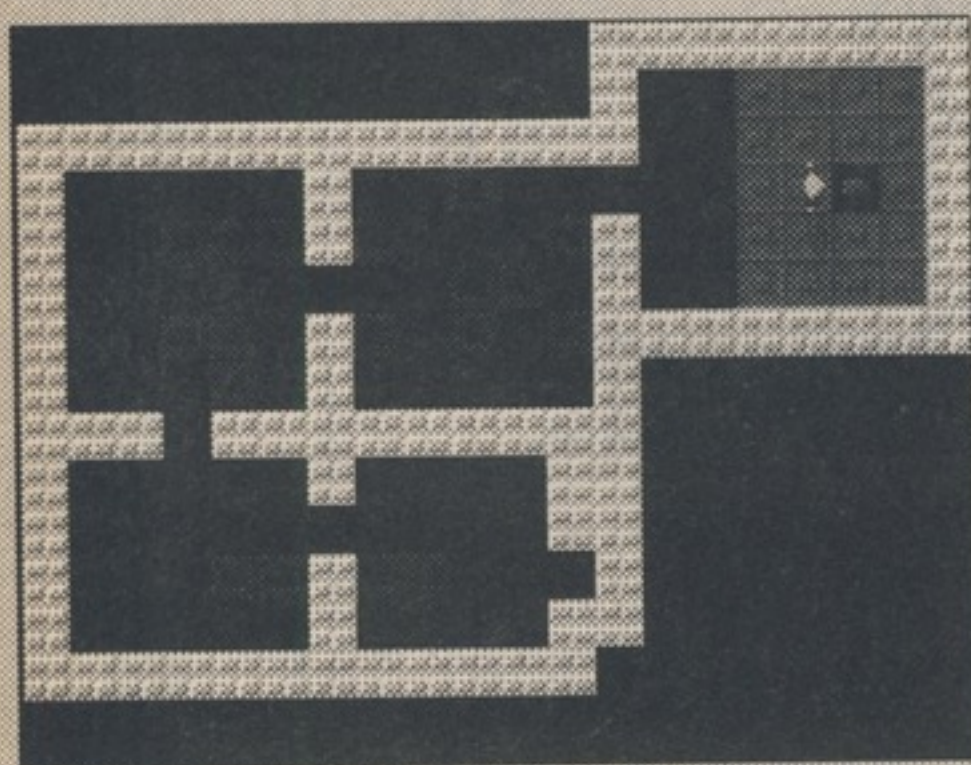
An old favourite makes it onto the ST. You play a factory worker whose task is to shift stacks of boxes through a warehouse. You do this by pushing them along the floor then placing them in predetermined spaces. It's been written in STOS, Mandarin's supercharged games Basic package to which so many PD programmers seem to be turning.

Problems arise because you can only push, not pull, the crates. Should

you push one into a corner, or get it stuck in some other position, then it's impossible to get the thing out again. The factory layouts are constructed in such a way that it's very easy to find yourself in a jam.

There are 50 levels to the game, and even the first is tricky, but not too hard, to solve. Your little bloke struts around with well-defined little steps. In fact the whole game, if not a graphical masterpiece, is very pretty throughout.

But despite having an arcade-style look the game definitely tests the mind more than the reflexes. Time and time again you find that you've made a mistake, usually when it's a tad too late to do anything about it. Once you accustom your thinking to the 'laws' of the game, though, you can spot the possible problems in advance. Be warned though. Once you start on a puzzle you may find it impossible to stop until it's finished!



• Soko shuffles onto your ST with the classic.

AMIGANUTS UNITED

169, DALE VALLEY ROAD, HOLLYBROOK, SOUTHAMPTON, SO1 6QX

0703 785680 - 10am to 6pm Mon-Fri

WE ARE THE OFFICIAL UK DISTRIBUTORS OF THE FANTASTIC T.B.A.G. DISKS FROM U.S.A.
THE VERY LATEST ARE ALWAYS AVAILABLE FROM US FIRST



284: PICTURE PUZZLES Can you connect the adult pictures?	£1.50	813: A-GENE Genealogy (FAMILY TREE DATA). (1 MEG Min).	£2.00
287: OFFICIAL NASA space pictures.	£1.50	814: AEROTOON ANIMATION. With Great Sound efx (1 MEG).	£1.50
389: PUGS IN SPACE Hilarious animation	£1.50	855: INNERSHIP An excellent new version of breakout.	£1.50
394: ALCATRAZ MEGADEMO III An excellent set.	(3 Disks). £4.00	861: GENOCIDE PICTURE SHOW (FOR ADULTS ONLY!)	£2.00
481: BREAKOUT construction game. With game editor.	£1.50	864: MOD PROCESSOR Want to make executable picture/music	£2.50
521: ALL NEW STAR TREK, AUTHORISED English lns.	(2 Disks). £4.00	progs? This will even work with MED music modules. A MUST!	£1.00
576: EDUCATION packed with progs for the children.	£2.00	865: The great Scoopex CHROMIUM demo + four others (1 MEG).	£1.50
581: SID - Finding the CLI. Slog? Prog?	£2.00	873: FRAXIONS latest slideshow called FUTURE VISIONS	£4.50
639: C MANUAL by Anders Bjerin. A three disk set, 200 pages of	£5.00	901: AMI-FX - issue 2 - A must for Fractal Fans. 2 disks (1 Meg)	£2.00
instructions on opening windows/screens/graphics/gadgets/	£3.00	905: PAIR IT. An excellent educational game for kids	£2.00
sprites. Loads of examples..(FULL KNOWLEDGE OF THE CLI IS	£2.00	906: DYNAMITE DICK - Dig for treasure. Avoid the bats. Good at	£2.00
REQUIRED).	£2.50	908: ANAGRAMS. A fantastic version at a realistic price	£2.50
649: BUDBRAIN TWO DISK MEGADEMO, (FOR ADULTS ONLY).	£2.00	***** THE LISTING BELOW IS FROM OUR LICENCEWARE PROGRAMS *****	
640: 8 GAMES INC TRAIN SET, A MUST for the kids.	£2.00	705: AMIBASE PROFESSIONAL. A very good database prog.	£2.50
680: WORD SQUARE SOLVER - Solve magazine puzzle squares.	£2.00	876: QUIZMASTER Think you know it all? Well now you can PROVE it.	
681: AMI-FX ISSUE 1 3 DISKS (FRACTALS) (1 MEG MIN).	£5.00	Each player enters their name and is represented as a racing car,	
700: D-COPY D1 EXCELLENT copier program, full instructions	£2.50	the first to answer all the questions, crosses the winners grid.	
706: 3 GAMES BY PH SOFTWARE. The TURN, TRICKY, MARBLE SLIDE.	£2.00	With save and re-load facility. (1-4 players) EXCELLENT.	£3.00
707: EIGHT COLOUR ICONS. All ready for your use.	£1.50		
717: MUSIC DISK 53 tracks, 90 MINS! (For the collection).	£2.00		
727: SLINTERS TALE II Rude, but funny. (2 Disks/Drives).	£3.00		
728: UTILS The Famous BOOT-SHOP, BOOT-KIT + others.	£2.50		
740: MED V2.13 A TOP quality version of this FANTASTIC music	£2.50		
utility, a host of new additions, including synth sounds.	£5.00		
741: NorthC V1.3 The VERY LATEST from Steve Hawtin, this set is on	£1.50		
TWO DISKS, packed with extra examples & advice on bugs.	£2.00		
755: SUPER C COMMANDS FROM TWILIGHT (FASTER C DIR PROGS).	£2.00		
758: BOOTBENCH This one is packed with bootblock utils.	£1.50		
760: Letter writers disk, Set up and ready for your letters.	£2.50		
790: PROFESSIONAL SOUNDTRACKER V1.0 is here! just press HELP	£1.50		
key, whilst running, for full instructions, ALSO latest Ntracker V2.12,	£1.50		
by Exolon And the FINAL version of DISKMASTER (V3), CLI TOOL.	£1.00		
798: ROB BAXTER'S AMIGADEUS (Mozart), classical music disk.	£4.00		
799: ROB BAXTER'S CLASSICAL MUSIC, (HANDEL & BACH).			
805: The Fantastic WRATH OF THE DEMON Animation Demo.			
812: STAR TREK U.S. Version. GOOD! (1 MEG) (2 Drives).			

* FREE! - When you order 15 or more programs from the ABOVE list you will receive an Amiganuts pen + Hypnosis 6 Demo disk - FREE*

FREE DISKS + FREE PROGS + FREE MEMBERSHIP - THERE ARE OVER A THOUSAND DETAILED PROGS LISTED ON THE MAIN CATALOGUE DISK. ONLY £1.00

ally, but it should provide a brief distraction when you're stuck twiddling your thumbs.

AMOS Paint • Amiga • Amiganuts • Disk 911

You too could be well on the way to becoming a world-famous artist with the help of *AMOS Paint*, a PD art package for the Amiga.

With *AMOS Paint* you will be able to draw pretty pictures on your screen with the aid of your mouse, and, of course, a dash of hand-eye co-ordination.

The utility offers many tools for would-be Van Goghs. You can draw lines, boxes and circles. In fact many of the tools you might find on a full priced art package are available on this program for next to nothing.

The painting environment is very simple to use. Should you want to add a dash of colour underneath the area covered by the icon bar, it obligingly moves out of the way. One thing it doesn't provide are guaranteed results. All my pictures were rubbish. Oh well, practice makes perfect.

It works best on a machine with at least one megabyte of memory. A500 owners can use the package as well but will have to sacrifice the undo function. As a result mistakes can't easily be rectified, which, if your artistic abilities are anything like mine, is a function which will be sorely missed. ■

1 Across 2 Down • Amiga • Amiganuts • Disk 877

1 Across 2 Down is, you might not be surprised to learn, a crossword program for the Amiga which lets you solve the puzzles on screen.

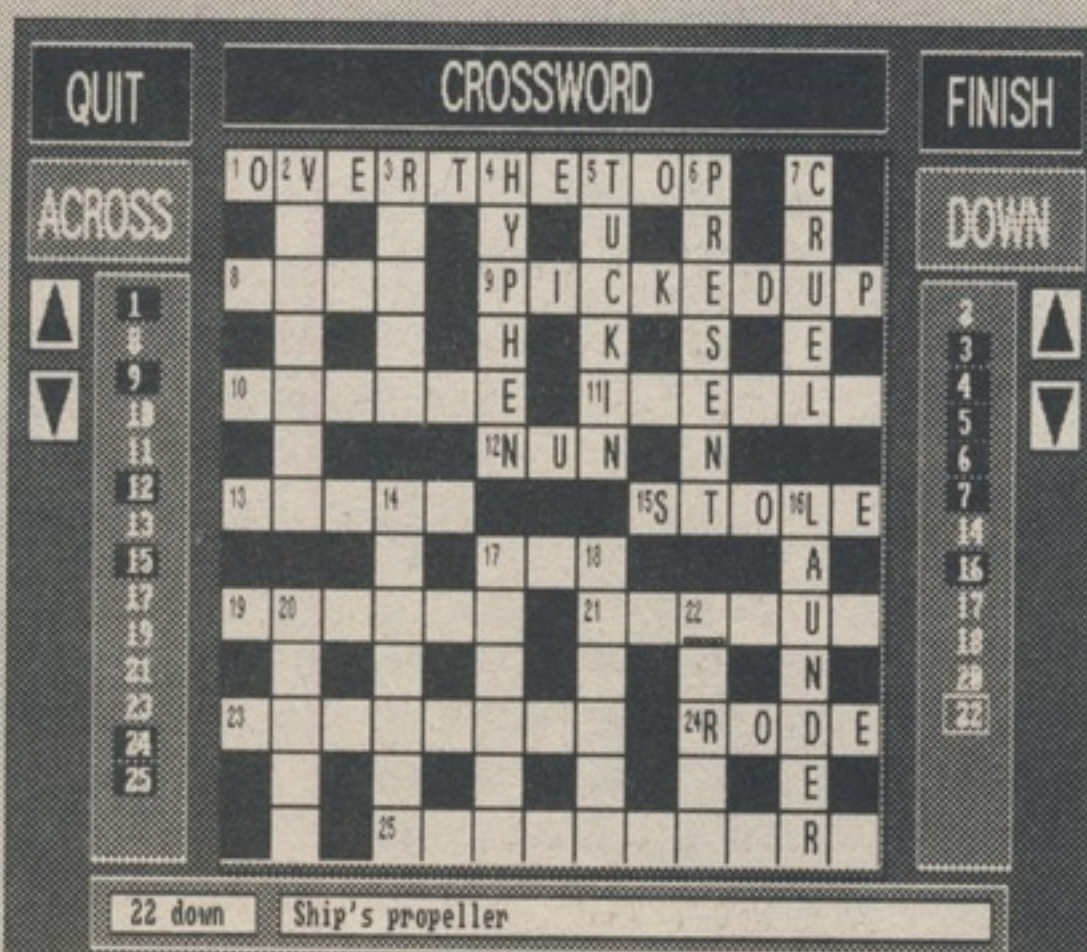
The main display is a large crossword grid. You can scan through the across and down clues easily with the mouse. The clue is displayed on a line at the bottom of the screen. When you think you have the answer, just tap it in and it appears as if you'd filled it in with a biro.

Two disks are used: a program disk which has the actual crossword software, and a data disk that holds the puzzles. There are eight brain-teasers

supplied on the initial disk, and further disks are promised to be released just as soon as they've been compiled.

So, how difficult are the puzzles? Well, I'm just about capable of solving the quick crossword in our local freebie (as long as it has the answers on the last page) and I found the questions in puzzle one fairly straightforward. Then again, subsequent releases could prove to be more of a challenge.

At any rate, *1 Across 2 Down* provides a high tech way of spending your tea break without first having to nip round to the corner shop to get yourself a newspaper.



• Tea break standard crosswords on the Amiga in *1 Across 2 Down*.

WHERE TO GO

The disks reviewed in this column and many others besides can be ordered from the following PD libraries:

AMIGANUTS UNITED

169 Dale Valley Road, Hollybrook, Southampton SO1 6QX. Telephone 0703 785680.

Are you nuts about your Amiga? Then call Amiganuts, a library that caters for the Amiga, and the Amiga only. Got that? Disks start at £1.50.

TRUST PD

18, The Park, Southowram, Halifax HX3 9QY. Tel 0422 341606.

If you're stuck for software for your ST, then you can trust these good people to sort you out. Single sided disks are £1.75, and double sided ones are £2.50.

THE DEMO CLUB

23 Alma Place, Spilsby, Lincs PE23 5LB. Telephone 0790 53741.

The Demo Club is totally devoted to demos on the ST. It claims that it is the original demo-only library, and boast over 400 disks in its collection. Disks are £2.50 each, the price dropping to £2.00 when you order ten or more. Should you decide to supply your own disk, then the price drops to £1.50.

PD & SHAREWARE who do you get yours from?



There are many PD libraries around but do they offer you....

- ★ Huge collection, thousands of programs on over 3000 disks
- ★ Same day service - 1st Class post - GUARANTEED
- ★ Knowledgeable staff on hand (no 'phone after six and ask for fred!)
- ★ Three years experience collecting and distributing PD & Shareware to satisfied customers all over the world.
- ★ Send £1.00 for catalogue - free with order - please request and state MAKE of computer CLEARLY.

AMIGA

currently over 800 disks in our catalogue, including Fred Fish, APDC, AMICUS, Panorama etc. Our own SOF collection is so good other libraries stock them now and of course we are exclusive distributors of the fabulous UGA disks. All are auto-boot, menu driven and so very easy to use, probably the best collection available! We also run an Amiga Club, ask for details.

ATARI ST

We currently stock over 800 disks full of PD/Shareware for these machines, containing every imaginable type of program! Choose from ALL the Public Domain, not just "a selection". If you are new to STing why not join "Clubville", our popular user group. £6.50 gets you newsheets, offers, special prices on goods, 5% Off blanks/PD etc.

IBM PC

(and compatibles)

Thousands of the most popular Public domain and Shareware programs in our current catalogue, all available on either 3.5" or 5.25" format, if ordering (opposite) state which. Whatever type of program you may require, we've probably got it.

MEGA PACK - £19.50 (£14.50)

5 PD disks + 5 blank disks plus a Library case

(Selection of current popular titles),
INTRO DISK - £1.50

(Atari or Amiga only)

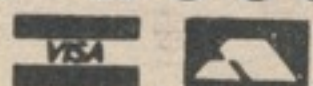
VIRUS KILLER DISK - £1.50

(state machine clearly)

(prices in brackets for 5.25" disks, state preference)

24 Hour orderline on

0705-266509



SOFTVILLE

Unit 5, Stratfield Park,
Electra Avenue, Waterlooville,
Hants. PO7 7XN

WEST LONDON PD

8 Berkeley Road, Hillingdon, Middlesex,
UB10 9DU

BLANK DISKS:

PRICES: 1-9 DISKS £2.00 10-49 65p EACH
10+ DISKS £1.75 50+ 60p EACH

All orders are despatched same day and are sent first class. All cheques and postal orders should be made out to **WEST LONDON PD**.

DEMO'S:

DEM 001 Union Demo
DEM 004 The Cuddly Demo
DEM 014 The Definitive Demo
DEM 182 Union Intro Compilation
DEM 314 Shadow Digi Demo
DEM 245 Delirious Demo 2
DEM 326 The Run
DEM 335 Syntax Terror
DEM 262 An Cool's STE Demo
DEM 266 Automation Intro Comp
DEM 323 Galton 6
DEM 308 Predator Demo
DEM 325 Overdrive
DEM 333 Walker Demo 2
DEM 334 Decade Demo
DEM 340 The Zuul Demo

ART:

ART 008 E. Plan
ART 010 Colour Burst 2
ART 009 Fractal Zoom V0.7
ART 003 Ani ST
ART 001 Neochrome V1.0
ART 020 Neochrome Version 2

CLIP ART:

CLA 001 Collection 1
CLA 002 Collection 2
CLA 003 Collection 3
CLA 008 Faces & Cartoon Chars.

SLIDESHOWS:

SSP 025 J.M. Jarre Album Covers
SSP 027 Page 3 Spec 512 pics
SSP 024 Animals
SSP 060 Pin-Up Girls
SSP 076 Madonna Slideshow
SSP 109 Fractal Slideshow
SSP 106 Paradise Fantasy Pics

UTILITIES

UTI 010 15 Disk Copiers
UTI 050 File Compacters
UTI 022 ZX81 Emulator
UTI 023 Star Chart
UTI 025 Sozobon 'C' Compiler
UTI 027 ZX81 Emulator Files

GAMES:

GAM 024 Quiz Whiz
GAM 021 Floyd the Droid
GAM 028 Dungeon Master Help
GAM 029 Arka (Mono)
GAM 031 Give Us A Break
GAM 032 Spectral Sorcery
GAM 038 Monopoly V2
GAM 041 Super Breakout (Mono)
GAM 045 Bunny Hunt
GAM 004 Hack
GAM 035 Fruit Machine
GAM 042 Solo
GAM 006 Krabat Chess

THE FULL CATALOGUE WILL BE SENT FREE ON REQUEST

TEL: 0895 53521

MAIL ORDER

0908 615049

Amiga A500 Screen Gems Pack £379 inc VAT & Next day Courier

Screen Gems Pack includes:

Amiga 500 512K keyboard with built in 1 Meg disk drive • Free TV Modulator worth £24.99 allowing you to use the Amiga with a normal TV • Joystick, mouse mat + 10 blank disks, mouse + mains plug • Amiga basic, Amiga extra's 13 workbench 13 PLUS Amiga step by step tutorial • With a further four new releases • Shadow Beast II, Back to the Future II, Nightbreed and Days of Thunder • Deluxe Paint II

Amiga A500 Screen Gems Pack Extra £399 inc VAT & Next day Courier

Screen Gems Pack includes:

Amiga 500 512K keyboard with built in 1 Meg disk drive • Free TV Modulator worth £24.99 allowing you to use the Amiga with a normal TV • 10 free games PLUS software has a potential RRP of £200 • Joystick, mouse mat + 10 blank disks, mouse + mains plug • Amiga basic, Amiga extra's 13 workbench 13 PLUS Amiga step by step tutorial • With a further four new releases • Shadow Beast II, Back to the Future II, Nightbreed and Days of Thunder • Deluxe Paint II

Amiga 1500

The Amiga 1500 Personal Home Computer is the ultimate in Personal Home Computers for the whole family. Platinum works - integrated - Word Processor, Database and spreadsheet. Deluxe Paint 3 - the ultimate in paint packages. Populous and Sim City - State of the Art strategy games. Battlechess - the chess programme amongst all chess programmes. Their Finest Hour - The battle of Britain brought to life in a technical flight sim. A1084's stereo colour monitor to get the best from your Amiga. The Amiga 1500 has been designed around the already popular Amiga A500, but with hardware facilities that would put any mid range business machine to shame.

Please call for further details
£1049.00 inc VAT + next day courier service.

AMIGA A500 CLASS OF THE 1990's BUSINESS + EDUCATIONAL PACK £499.00 inc VAT & next day courier

FEATURES

Amiga A500 TV Modulator • Midi Interface-Software • Kind Words II wordproc'or • Page Setter DTP • Super Base Personal Database • Maxplan 500 spreadsheet • Amiga Logo BBC Emulator Deluxe Paint II • Mouse mat 10 Blank Disks and disk wallet

AMIGA A500 SOUND & VISION PACK
£399 inc VAT & next day courier
Amiga A500 512K keyboard with built in 1 Megabyte Disk Drive • Free TV Modulator worth £24.99 allowing you to use the Amiga with a normal TV • Deluxe Paint II Graphics Package • Shadow of Beast II horizontal scrolling games software • Back to the Future film action software • Nightbreed state of the art graphical arcade action • 10 free games worth £200 • Free joystick, mouse mat & 10 blank disks • Amiga Basic Amiga Extras 1.3 Workbench 1.3 PLUS the Amiga Step by Step Tutorial • All leads, manuals PLUS Mouse and Mainsplug • PLUS Days of Thunder serious fast action games software • Deluxe Paint II

HALF MEGS - Quality four chip ram board with complete utility disk support with software on/off switch.

£34.99

AMIGA + ST DRIVES - A powerful 880K formatted drive with an external on/off switch, anti clicking and daisy chain facility.

£59.99

MONITORS

Commodore Amiga A1084 Stereo Monitor inc lead £269.00

Philips CM8833 stereo colour monitor inc lead for ST or Amiga £259.00

4096 coloured stereo monitor with first class reproduction including leads for ST & Amiga £259.00

Naksha Mouse - Quality micro switched, accurate Amiga ST
£26.00

Contriver Mouse - The perfect direct replacement mouse for the ST or Amiga
£18.00

PRINTERS

Star LC24 200 24PIN including ST/Amiga £259.00

Star LC200 including lead for ST/Amiga £210.00

Star LC10 colour including interface lead for ST/Amiga £219.00

LC10 - The most popular letter quality printer on the market only £219.00 with all Amiga + ST leads

Tel: 0908 564369, FAX: 0908 262551

MICROSMART 24HR HOTLINE (24 HRS) TELEPHONE 0908 564369

TITLE	COMP	PRICE
TOTAL COST £:		

Have you ordered from us before? YES NO

NAME:

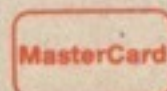
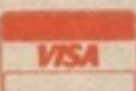
ADDRESS:.....

.....

.....

TEL NO:

Please send this to Microsmart, 127 High Street, Newport Pagnell, Milton Keynes, Bucks MK16 8SE



MiG-29

F U L C R U M



The Soviet Union has produced the finest air superiority fighter in the World.

Now Domark give you the thrill of flying the formidable MiG-29 Fulcrum on your computer.

Prove your skills in a series of gruelling missions based on real life scenarios.

MiG-29 Fulcrum – the ultimate experience in combat aviation.

ONLY THE MiG-29 FULCRUM SIMULATION OFFERS:

- ✧ Full force aero model
- ✧ Ergonomically optimised controls
- ✧ Actual instruments and avionics
- ✧ Accurate modelling of high g-effects on pilot, including simulated black-outs
- ✧ "Expert-driven" combat systems
- ✧ Unique missions featuring real world scenarios



DOMARK

Programmed by Simis Ltd.

Software, Instructions, Artwork and Packaging ©1990 Domark Software Ltd.

MiG-29 photographs courtesy of John Lake/Osprey Publishing ©1990

Published by Domark Software Ltd., Ferry House, 51-57 Lacy Road, London SW15 1PR. Tel: (081)-780 2224.

Available on: Amiga, Atari ST, IBM PC 3.5" & 5.25". Amiga, Atari ST, IBM PC screenshots.

"The most realistic high 'g' flight simulator for the home computer"
John Farley, Test Pilot
(The first European to have flown a MiG-29 Fulcrum)



• **Beastbusters:** blood and guts, guts and guns, and more guts.

PREVIEWS

News of Activision's demise is still proving to be a little premature. It seems that the ailing American giant has several products waiting in the wings for release over the next couple of months. And what's more they're all either designed or programmed in Britain!

Hunter is a radical game which the company has done pretty well to keep under wraps for so long. It features some amazing filled vector graphics and more gameplay than you can shake a very large and powerful stick at.

You're a soldier, working for "Our Side" and you have many missions to fulfil. Depending on the style of game you choose, you may have one long mission that takes you all over the world and lasting several hours,



GAMES WEEK

Neil Jackson gives you the low-down on the latest new games, playing tips, cheats and news.

or one of a bunch of shorter missions which have a more racey action feel.

All missions involve the use of a number of special items to help you in your quest. Strewn all around the world you find cars, trucks, ambulances, bicycles, hovercrafts, helicopters and boats waiting to take you away. Vector rabbits and ducks wander about the landscape, waiting to be caught and eaten, and villages contain all kinds of dwellings, usually with goodies inside.

While roaming around you meet other soldiers, nurses and civilians, some enemy, some friendly and some equally rude to both sides. An enemy uniform comes in handy for some low-grade espionage and the gun is even handier when you've been sussed! Activision is currently looking at a March release date for this tasty looking Amiga and ST treat.

Activision is also ready to announce the release

date for *Beastbusters*, an SNK arcade conversion featuring all kinds of blood bespattered zombie nonsense. In an *Operation Wolf*-style, *Beastbusters* puts you head to head with all sorts of rotting nasties that splurge and disembowel in true Cronenberg fashion. Look out (through your fingers) for this during April.

Also lurking in Activision's new Reading HQ, you'll find *Deuteros*, the long-awaited sequel to *Millennium 2.2*. *Deuteros* is set a thousand years after the completion of its predecessor, somewhere around the year 3300 AD.

At this time, the once-strong empire of solar system colonies has collapsed. Old alliances have faded into obscurity, colonies have all declared independence and the moonbase has been forgotten since the Earth was terraformed. Legends and myths recall those historic times, but nobody is sure whether it's fact or fiction. ➤

PLAYING TIPS

CONSOLE ZONE

NEC PC ENGINE

Don't do anything in the *Galaga* bonus round for an even better bonus score and a cute little alien dance!

SEGA MASTER SYSTEM

The white stone in *Ultima IV* is located in the mountains of Serpents Spine.

NINTENDO GAMEBOY

Thanks to Dominic Brookman from Kenilworth in Warwickshire for these *Golf* tips. Novices should start on the Japanese course as it has far fewer trees and hazards. Practice the back spin and the super shot as they could lead to

birdies. When in the rough use the pitching wedge for the best possible shot. Pay attention to wind levels especially when you are on the greens. Aim for birdies and eagles; and you're get treated to a spectacle of yourself jumping about with delight.

SEGA MEGADRIVE

The passcode for the final *HERZOG ZWEI* round is LJJOIGLAOKN

ATARI LYNX

Thanks to Nicholas Wells from Norfolk for this *Gates of Zendacon* tip. Enter TRYX as a code. As soon as your ship appears, go down and right to go straight through the platform. Dodge the walls and go in the first gate. You will be on a secret level.

NINTENDO ENTERTAINMENT SYSTEM

Enter this *Metroid* password to change Samus into a woman: JUSTIN BAILEY

SPEEDBALL 2

Atari ST and Amiga • £24.99

After two years waiting, the illustrious Bitmap Brothers (of *Xenon* fame) have released the sequel to their smash hit *Speedball*. The name of this offering? *Speedball*, er, 2. Not such a good start really, but never mind.

The game, like its predecessor, is based on a futuristic sport, pumped to the hilt with violence, aggression, excitement and action – all the things you really need for another smash hit. It's a team game, with two hordes battling over control of a large metal sphere (called, er, a ball) and attempting to place it into a large open-ended hole (called, er, a goal) at either end of the flat, metal-panelled floop (called, er, a pitch).

Each game consists of two halves of 90 seconds during which you control one team. The other team can

be controlled by the computer or by another person, depending on your social standing, personal odour, etc. The ball is fired from a machine which pops up from the floor and then, basically, all hell breaks loose. There are no foul rules, out-of-play rules or many rules at all really. In fact you actually get extra points for disabling the opposition members!

When a player has the ball, a large letter appears above his head, telling you whether he's a midfielder, attacker or a defender, and depending on his abilities whether you need to tackle him or just smack him in the gob. You control the method, and hopefully the remaining members of your team will back you up. Occasionally they just nip off somewhere else for a quick

scrap, leaving you to fend for yourself.

All around the outside wall of the pitch are special icons, which include warp-gates (for transporting the ball downfield), score-multipliers and electro-bouncers (for making the ball unstoppable). You'll also find money and a variety of power-ups appearing on the pitch itself.

Speedball 2 can be played in a number of different game-formats – knockout, league, cup and exhibition matches. The first three types involve management too, which forces you to build up your team's abilities over a period of time. You can train your players and give them extra speed, stamina and intelligence, providing you win the required points from each game.

Speedball 2, while being a sequel, is still a fantastic game. Sound effects are superb, with all manner of cyber-punky crashes, smashes and "oofs" emanating from your monitor. Graphically, it is again superior. The images are stunningly well drawn, with perfect highlights and "chrome-look". And the game is fast. Very fast! So fast that sometimes you'll need to use the extra Replay option to see what really happened.

If you missed *Speedball 1*, don't make the same mistake with *Speedball 2* – it's too good to overlook. If you've got *Speedball 1*, then the incredible amount of extras in *Speedball 2* practically makes it a different game. Go on, you still want it really!



• **Speedball 2:** Futuristic football violence and team mis-management to boot!

★ POCKET SIZED ★ PC-COMPATIBLE ★ PERSONAL ORGANISER ★



THE PC IN YOUR POCKET

The new Portfolio from Atari is the world's first pocket-sized electronic organiser that is also a powerful PC compatible computer, with a full QWERTY keyboard and scrolling 80x25 character display.

Portfolio includes everything you would expect from an electronic organiser - an address and telephone book, time manager, diary and sophisticated calculator.

Portfolio also includes several functions that you would not expect - a spreadsheet for your personal budget and expense records, as well as a text processor for typing memos and letters.

And, because Atari's Portfolio is PC compatible, it can communicate with your desktop PC at home, or in the office. You can transfer files from one to the other, to enable you to update your reports and figures with the Portfolio while you are on the move.

FOR ONLY **£199** INC VAT

SPECIFICATION

- ★ **Processor:** Intel 80C88 at 4.9152Mhz.
- ★ **Operating System:** Compatible with MS-DOS 2.11.
- ★ **Internal ROM:** 256K containing BIOS, operating system and applications suite.
- ★ **RAM:** 128K with an internal RAM disk, configurable from 8K. Externally expandable to 640K RAM.
- ★ **Keyboard:** 63 keys, QWERTY, IBM PC BIOS compatible. Buried numeric pad and function keys. Optional key click.
- ★ **Character Set:** Extended IBM ASCII (255 characters).
- ★ **Mass storage:** credit card sized memory cards (32K or 64K or 128K RAM).
- ★ **Display:** Graphics LCD, supertwist technology, MDA compatible, 40 columns x 8 lines, 240 x 64 pixels (with the option to window a full 80 x 25 character display). Keyboard controlled contrast.
- ★ **Peripherals:** 60 pin expansion BUS to take serial and parallel ports and memory expansion units.
- ★ **Size:** 8" x 4" x 1" (200mm x 105mm x 29mm).
- ★ **Weight:** 495 grammes (with batteries).
- ★ **Applications:** calendar and diary, address and phone book, Lotus 1-2-3 compatible spreadsheet, text processor, communications software.

COMING SOON!

In addition to the excellent software built-in to the Portfolio Free of Charge (see right), other software and peripheral products, such as the sophisticated Pocket Finance package and serial/centronics interfaces are available. And it doesn't stop there. Many manufacturers have recognised the potential of the Portfolio and have already started to design new peripherals and software. Products currently under development include: Serial interface with built in mini modem, Apple Macintosh interface, business, utility and programming software plus a range of adventure and battle strategy games. For further free details on the Portfolio range, fill in the coupon below and return it to Silica Systems now.

5 BUILT-IN APPLICATIONS! TO GET YOU ORGANISED!

To get you started, Portfolio comes with a suite of five useful functions built-in, all accessible from a simple menu display.

TIME MANAGER

More than just an electronic diary, the Portfolio Time Manager enables you to plan your appointments via a comprehensive calendar and diary. It can even be programmed to sound an audible alarm at specific times to remind you of important appointments.

CALCULATOR

Your Portfolio will be invaluable in the office or at home as a powerful pocket calculator. It has a full range of functions, including factorial,

power and root calculations, all with multi display formats and memories.

ADDRESS BOOK & DIALLER

Portfolio has a complete address book facility that allows you to store hundreds of addresses and phone numbers. And, at the touch of a button, you can retrieve any one of them, or search for a specific grouping, such as "all Italian restaurants". And, when you are ready to book your table, hold your Portfolio to your telephone mouthpiece and use its special built-in tone dialler to dial the number for you.

TEXT PROCESSOR

The Portfolio's built-in text processor program

includes word wrap, line and column count, string search, in fact most of the functions you would find in a word processor. It handles printer and word processor control codes and allows easy transfer of files between Portfolio and your desktop PC.

SPREADSHEET

For real calculating power, Portfolio has a Lotus 1-2-3 compatible spreadsheet built-in. It has 127 columns x 225 rows and reads/writes Lotus V1.0 and V2.01 files, so you can transfer data to and from Lotus 1-2-3 on your desktop PC. The Portfolio's 256K ROM includes MS-DOS and PC BIOS compatible systems software.



MEMORY CARDS

Portfolio can store and retrieve data and programs from its own RAM, or from small credit card size memory cards, that slot into its built-in card drive. The cards are available in three sizes, 32K, 64K and 128K, so you can carry a library of data in your pocket. The card drive also accepts ROM cards, which can contain commercial or custom software.



POWER SUPPLY

Portfolio is powered by three AA batteries which will run for up to six weeks with normal use, or from the mains using an adaptor. All the peripherals take their power from the Portfolio, so no extra batteries or adaptors are required. A 'battery-low' warning and memory back-up ensure that information is not lost when the batteries are changed.



INTERFACES & PERIPHERALS

Portfolio can communicate with other computers and supports a growing range of peripherals via a built-in 60 pin bus connector. Peripherals available include serial and parallel interfaces and memory expanders (to 640K). You can also add a card drive to your desktop PC, to enable it to read/write to Portfolio's cards.

SILICA SYSTEMS OFFER YOU

FREE OVERNIGHT COURIER DELIVERY: On all hardware orders shipped in the UK.
TECHNICAL SUPPORT HELPLINE: Team of Atari technical experts at your service.
PRICE MATCH: We normally match competitors on a "Same product - Same price" basis.
ESTABLISHED 12 YEARS: Proven track record in professional computer sales.
£13M TURNOVER (with 60 staff): Solid and reliable with maintained growth.
BUSINESS/EDUCATION/GOVERNMENT: Volume discounts available for large orders.
SHOWROOMS: Demonstration and training facilities at our London & Sidcup branches.
THE FULL STOCK RANGE: All of your Atari PC requirements from one supplier.
FREE CATALOGUES: Will be mailed to you with offers and software/peripheral details.
PAYMENT: By cash, cheque and all major credit cards.
CREDIT PAYMENT TERMS: Silica are licensed credit brokers - details on request.

Before you decide when to buy your new Atari Portfolio, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your Portfolio, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new Portfolio products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is a new division of Silica Shop, the UK's leading Atari specialists. This new division has been established to provide a service to the more serious home user, as well as to business and education purchasers. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature and begin to experience the "Silica Systems Service".

SILICA SYSTEMS

MAIL ORDER: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX **Tel: 081-309 1111**
 Order Lines Open: Mon-Sat 9.00am-6.00pm No Late Night Opening Fax No: 081-308 0608
LONDON SHOP: 52 Tottenham Court Road, London, W1P 0BA **Tel: 071-580 4000**
 Opening Hours: Mon-Sat 9.30am-6.00pm Late Night: Thursday until 8pm Fax No: 071-323 4737
SIDCUP SHOP: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX **Tel: 081-302 8811**
 Opening Hours: Mon-Sat 9.00am-5.30pm Late Night: Friday until 7pm Fax No: 081-309 0017
BUSINESS/EDUCATION: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX **Tel: 081-308 0888**
 Order Lines Open: Mon-Fri 9.00am-6.00pm Closed on Saturdays Fax No: 081-308 0608

To: Silica Systems Ltd, Dept NCE0291 38 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND INFORMATION ON PORTFOLIO

Mr/Mrs/Ms: Initials: Surname:

Address:

Postcode:

Tel (Home): Tel (Work):

Company Name:

Which computer(s), if any, do you own?

E&OE - Advertised prices and specifications may change - please return the coupon for the latest information.



• Deuterios: (top) A thousand years after Millennium 2.2 and the Earth's wrecked again. (Bottom) Spread your influence throughout the galaxy and re-establish your former status.

Your job is to investigate, first by locating the old moon-base (to prove that it exists) and then exploring the rest of the solar system to find any remaining colonies.

Deuterios is a vast game, much larger than its predecessor. In it you'll discover all kinds of weird and wonderful devices, ships and shuttles. The command-issuing system is a much-refined version of *Millennium's*, but it grows in its abilities as you progress through the game. Just as certain tasks become repetitive, you'll discover something to make it a whole lot

easier. And as you'd expect, you'll be getting all kinds of heat from someone, somewhere, who has a score to settle. *Deuterios* is due out for Amiga and ST at the end of March.

Finally, the sequel for *R-Type*, cunningly called *R-Type 2*, is also due from the company sometime early this year. The word is that it will be released just as soon as ARC, the development team working on the game, has finished the code and the product has been tested. More news when we get it. ■

TOP 10 SIXTEEN-BIT GAMES

THIS WEEK	LAST WEEK	CHART WEEK	TITLE	PUBLISHER	MACHINE
1	NE	1	<i>Final Whistle</i>	Anco	AG
2	1	7	<i>Powermonger</i>	Electronic Arts	ST AG
3	5	20	<i>F-19 Stealth Fighter</i>	Microprose	ST AG PC
4	6	12	<i>Lotus Turbo Challenge</i>	Gremlin Graphics	ST AG
5	4	8	<i>Teenage Mutant Hero Turtles</i>	Mirrorsoft	ST AG PC
6	16	6	<i>ESWAT (SG)</i>	SEGA	OT
7	2	20	<i>Kick Off 2</i>	Anco	ST AG PC
8	3	8	<i>Robocop 2</i>	Ocean	ST AG
9	NE	1	<i>BAT</i>	Ubisoft	ST AG
10	NE	1	<i>Chaos Strikes Back</i>	Mirrorsoft	ST AG

For the week ending 19th January 1991

ST - Atari ST AG - Commodore Amiga PC - IBM PC or compatible OT - Other
Chart compiled by Gallup. © European Leisure Software Publishers Association.

LOOM

Amiga, ST and PC

Here's a few weird things to try if you're getting bored or stuck in Lucasfilm's *Loom*, or if you've completed it and didn't know there was more to do!

- Leave the egg-chamber without opening the egg.
- Spin Open and Close on the clam at the dock. (You could also wait until you can play the "F", lead the gulls out to sea, then return and play with the clam.)
- Spin Dyeing and Bleach Green on the tapestries in the Sanctuary.
- Spin Night Vision on the sky above the cliff top.
- Look at Cygna's gravestone, Open the sky from the cliff top, then go back and look at the gravestone again.
- Open any of the graves (before Mandible does, of course).
- Try to Fill the graves.
- Close the owl holes.
- Try to sail /itals>past/ the waterspout to the mainland.
- Open and Close the chalice.

- Fill the chalice before double-clicking on it to summon Master Goodmold.
- Read the grave-markers in the dome, after you've talked to Master Goodmold about the goblet.
- Spin Terror on the workers in the Scythe Room while Bobbin is invisible.
- Reverse the Invisibility Draft on the workers while in the Scythe Room.
- Dye the dozing shepherd's sheep green, then wake him up.
- Dye the lamb in the manger.
- Leave the hut without looking at the lamb.
- Try Terror on the lamb (you rotten swine you!).
- Look at the dragon.
- Look at the dragon's gold.
- Spin Terror on the dragon before turning the gold to straw.
- Open and Close the pool in the caverns.
- Each of the three Spheres shows three scenes; did you

find them all?

- Did you find the Sphere in the Caverns? Empty the pool.
- Sneak into the forge as Bobbin, over and over again.
- Spin Wake on Rusty again.
- Go in and out of the Forge gate, while disguised as Rusty.
- Change the straw in the Forge cell to gold.
- Fill and Empty the wood bin.
- Twist the sword Edgewise is making instead of blunting it.
- Try to leave the Forge graveyard without healing Rusty.
- Spin reflection on Rusty's corpse.
- Dye the dead sheep and the shepherds green.
- Spin Terror on the dead and dying shepherds.
- Try to heal Master Goodmold.
- Heal the holes instead of Closing them.
- Try to spin as draft on Chaos.

And here's a list of Drafts and where they're located:

DRAFT	WHERE FOUND
Transcendenc	Any of the Spheres
Opening	Loom Chamber (from the egg)
Night Vision	Woods (from the owls)
Straw into Gold	Dark Tent (from the spinning wheel)
Dyeing	Dye Tent (from the dye pot)
Emptying	Dye Tent (from the flask)
Twisting	At Sea (from the waterspout)
Invisibility	Mainland Forest (from the sentries)
Sharpening	Crystalgard (from the scythe)
Terror	Crystalgard (from the Sphere)
Sleep	Meadow Fence (from the sheep)
Healing	Shepherd's Hut (from Fleece)
Reflection	Cavern under Dragon's Mountain (from the pool)
Silence	Loom Chamber (from Chaos, via Loom)
Shaping	Loom Chamber (from Chaos, via Loom)
Unmaking	Loom Chamber (from Chaos, via Loom)



The ST's impressive reputation in the music world is almost entirely attributable to the fact that the ST came with built-in MIDI ports as standard. Musicians have been exploiting the enormous potential of the ST's MIDI ports from the earliest days, and because of this you can lay your hands on music software which costs as little as £2.50 or as much as £500, depending on the size of your wallet and your passion for music.

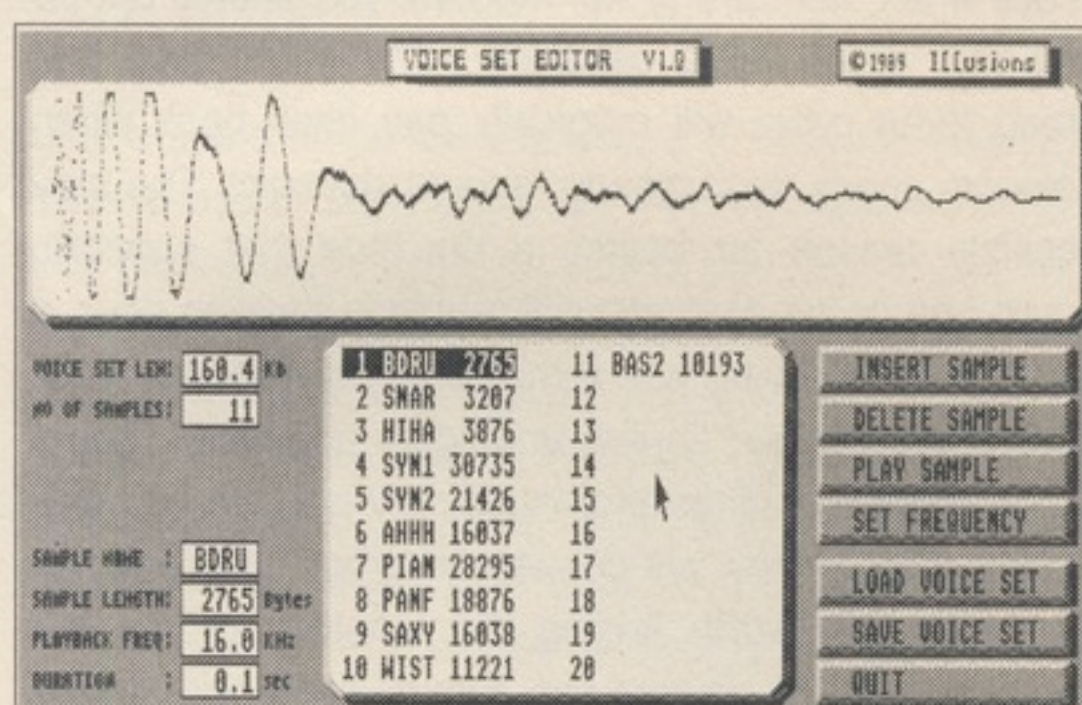
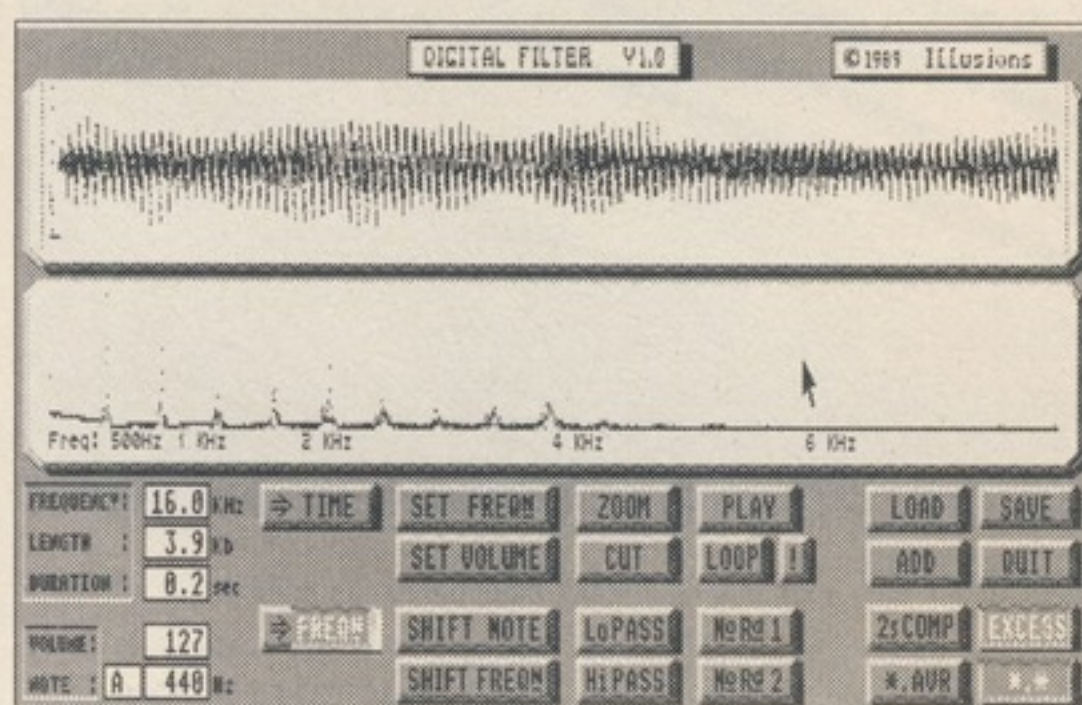
ST manufacturer, Atari, revelled in all this attention and at the end of '89 it released a portable version of the ST – the Stacy – armed with MIDI ports and hard drive. Now you can even take an ST onto the stage and use it to pull in those crowds.

MIDI is a serial link similar to RS-232. It transfers data from one MIDI device to another in digital 'packets'. Connections are made through 5-pin DIN sockets and on most MIDI devices you'll find a MIDI OUT, which transmits signals, MIDI IN, which receives them, and sometimes a MIDI THRU, which passes signals through the instrument to other devices. In the ST, MIDI THRU is hidden on two spare pins of the MIDI OUT socket.

The ST music scene isn't limited to MIDI. In fact, you can create a wealth of tunes without ever plugging anything into those innocuous ports on the side of your machine. One option is to program the ST's internal sound chip. While the sound quality isn't particularly impressive, it does provide a useful step into the heady world of music.

QUARTET

ALL STS • MICRODEAL • £49.95



What do you do with a digitised sound once you've got it into memory? Play it back several times, reverse it, squash it, move sections. Then what? Microdeal has come up with the answer – a composing tool which uses sampled sounds as the instruments. What's really astonishing, though, is that it's possible to have four channels of sequenced sampled sound playing simultaneously.

Up to 20 instruments can sit in memory, and each note can have any of the memory-resident samples assigned to it. Complete sets of instruments can be loaded and there are over 100 individual ones provided.

Quartet provides two MIDI modes: Poly Play and Record. In either mode it's possible to alter the current sample by pressing the instrument-select keys on your synthesiser. Poly Play takes the sample selected in Quartet and enables you to play your instrument using

MUSICAL GREATS



The ST is absolutely unbeatable in terms of music. Mark Higham looks at why no other home micro has been met with such enthusiasm from the music world and reviews some of the best sound programs.

up to four channels. The Record mode is arguably more useful, since it enables you to play your MIDI instrument and have the notes automatically appear in Quartet's active stave.

Because of the way Quartet works, compositions lasting several minutes take up very little memory. A typical song might take up 3K. The sampled data might add another 32K and the replaying routines a further 16K. That's little more than 50K for a hit composition.

Quartet is amazing. Play around with it and you just won't believe the sound you hear coming out of your ST. You don't need a sound sampler to use the program as there are so many instruments provided. If you're an enthusiast interested in making music, Quartet is the package to beat all others.

MUSICAL

ALL STs • £39.95 • EVENLODE SOUNDWORKS
• 0993 898484

If you're a beginner looking to compose and eventually perform music of a high calibre, MusiCAL has been designed for you. It's a set of five programs that lead you through the principles of music.

Unit One is a simple composing program that uses an external MIDI keyboard. The idea is that you make up little short patterns of music in four on-screen boxes.

Unit Two uses the internal voices instead of MIDI and is a great way of showing the physical shape of sounds and soundwaves. You have five preset sound shapes and when a note is played, you get to hear it while the waveform frequency fills in the sound shape.

Unit Three tests your ear by giving you notes and asking you to tune another note to it. The note is altered by a large slider, but you don't hear the note change as you adjust it.

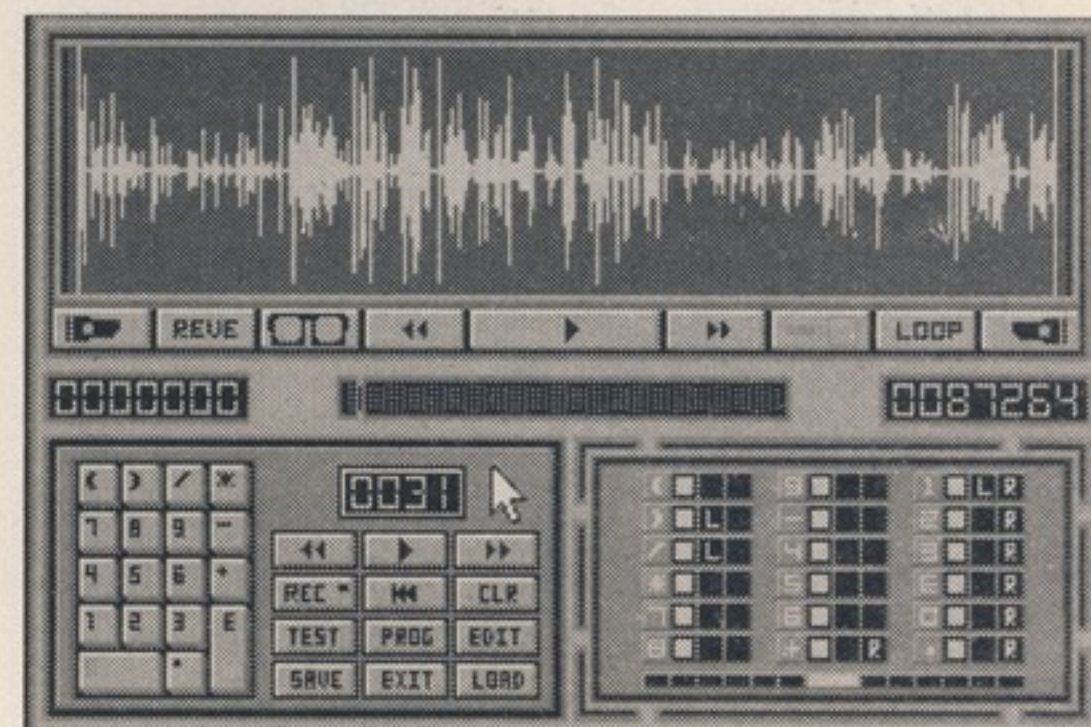
Unit Four is a simple composing program that uses what is technically known as a pentatonic scale – five notes arranged in the same order as the black notes on a keyboard.

Unit Five involves percussion only. You write in drum patterns using three lines of music – one for each instrument.

MusiCAL, and particularly the accompanying text, is a well thought out package. It would have been an advantage to make all the units work without the aid of MIDI instruments, something that is not too hard to do, because it would free up one more MIDI instrument for the classroom if necessary. There's no doubt that at this price it's a bargain and it could even suit mature pupils who wanted to start on a computer assisted music primer course

MASTERSOUND

KEMPSTON DATA • £34.95



This comes from the programmer who created Prosound and the whole environment bears more than just a passing resemblance to its predecessor.

Mono input is taken from a cassette player and fed into the cartridge. Once the sample has been grabbed it appears in the display window as a wave pattern with peaks and troughs representing the volume.

The sample can be subjected to all sorts of punishment using the icons and shifting pointers. A useful feature not present in Prosound is the ability to fade the sample in and out and also to make volume increases in selected areas. With options to zoom in on areas of the sample, you can ensure that editing is as precise as you need. The sequencer is the best side of the package, allowing you to load up to 18 samples and then play them back in a pattern. This works by enabling you to assign sections of the sample to the 18 keys on the keypad and then programming them to be replayed in order.

With the samples compatible with most others on the market, it's simple enough to progress onto more expensive packages at a later date or even to follow the current trend in stealing tracks from games. However, the sequencer is not compatible elsewhere.

Master Sound is a tool for playing with music rather than designing professional sounds. The environment is simple to get used to and surprisingly effective results can be obtained in no time at all. This is one of the best samplers around, offering the kind of quality to match more expensive models.■

Mark Higham is editor of ST Format magazine. These articles are reprinted from his book, Get the most out of your ST, available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. Price £9.95.

Faxes have been with us for nearly a quarter of a century. A small fax terminal can sit on one corner of your desk or even in a slot in your PC and give you the ability to transmit complicated documents anywhere in the world instantaneously. It wasn't like that when the first of these machines appeared though.

The first facsimile (fax) machines were large noisy mechanical monoliths that languished in baths of noxious chemicals and produced a smell not dissimilar to a linoleum factory. These huge document processing engines were prone to breakdown and the quality of their output was questionable to say the least.

At the beginning, the fax was the domain of the multinational corporation, the broker and the public utility. Ideally the first generation of fax would live in a room on its own, preferably as far away from civilisation as possible. The size, noise and smell meant that the fax wasn't a user-friendly office trained instrument. At the time it had the mail, Telex and telegrams to contend with and was the last option when a document had to be sent in a way that guaranteed it would be received immediately.

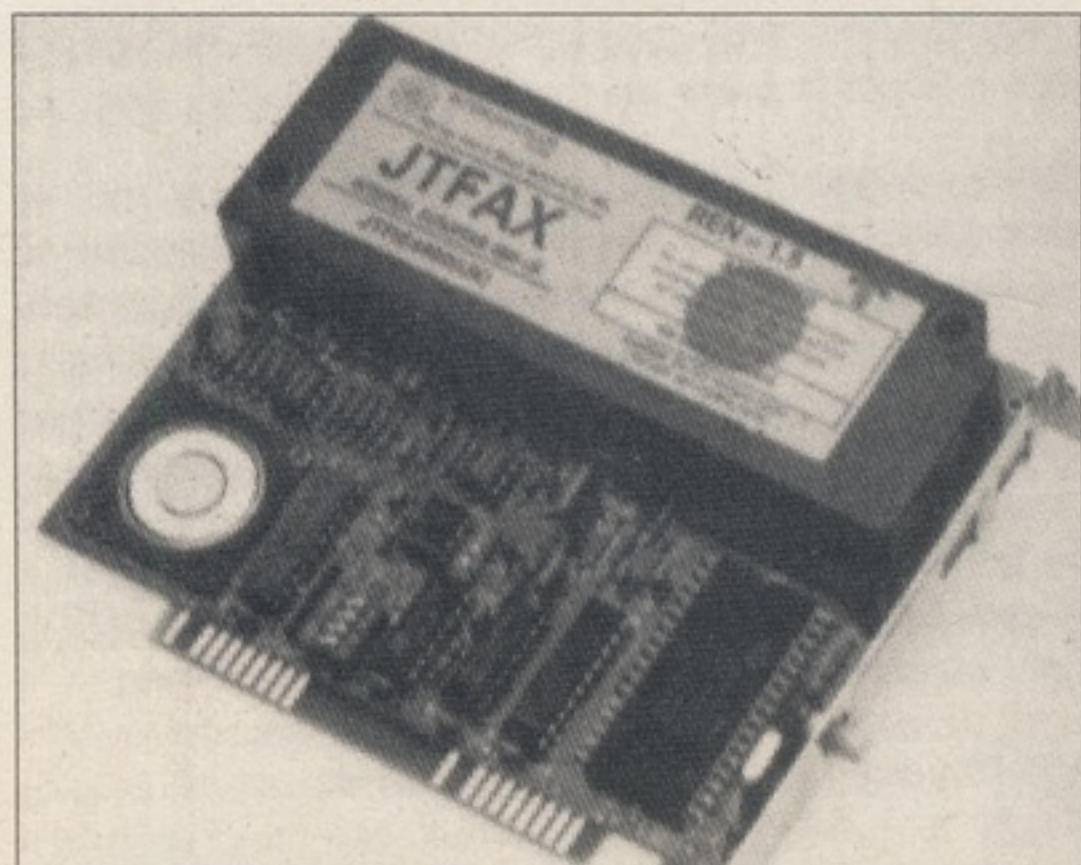
Faxes use the same phone lines as voice communication and so can be routed to any one of the billion or so phone lines in the world. As long as there's a fax machine on the line at the other end, a document can be sent as simply as dialing a number and chatting.

Unlike computers, there is generally one set of protocols for fax. If there's a fax machine at the other end of the phone line that supports the same group of data transmission as yours, you're in business. While the computer world still flounders around with over a dozen environments and operating systems, fax offers one system divided into four well documented groups.

A stand-alone fax machine is a combination of several things. In order to transmit an image down the phone lines, it needs to be able to read the image into a form that can be processed electronically. So the first part of the fax is the scanner. In a simple fax, a document would be fed into the machine and scanned as it passes the scan head. The scan head reads the paper and produces a bit image of the document.

The fax takes the bit image and converts it into a form that can be electronically parcelled for transmission over the phone lines. A dedicated modem in the fax modulates the data into an audio signal that can safely be carried over the public phone network while retaining data integrity.

In receive mode, the internal modem of the fax demodulates the signal and converts it into a form that can be sent to the fax's internal printer. Thus a fax is a scanner, processor, modem and printer. Most modern faxes have the ability to short cut the system and read directly from the scanner to the printer. This makes them a useful occasional photocopier although it's an expensive and slow way to generate photocopies and the thermal paper used by most faxes doesn't produce the best copies.



• The interQuadram JT fax board sits inside a PC and lets you send faxes at the touch of a key with no paper involved.

With fax machines came yet another means of communicating information – and not just in words. Keith Pomfret looks at what these machines have to offer and which type is best for you.



• British Telecom's CF500 facsimile can act as the hub machine in a fax network.

Other bolt-on features can allow a fax to work unattended, sending messages at night when lines aren't busy and calls are cheaper. With all this talk of scanners, modems and printers, you could be forgiven for thinking that fax is an arm of computer technology. Life's never that simple though. While fax uses similar technology to computers, its protocols are different.

GROUP STUDY

The fax protocol was rationalised and defined by the Consultative Committee on Telegraphy and Telephony (CCITT) in Geneva. It initially agreed on a standard protocol for fax and this currently consists of four groups. The original steam-driven clanking faxes of the Seventies were group one. This is a fairly primitive analogue system. A group one fax can take around eight minutes to transmit a page and the quality of the output is what you would expect from earlier technology. If you are considering buying a fax and someone offers you a group one machine, steer well clear unless the vendor is benevolent enough to pay your phone bill too. A cranky group one machine can make a 300 baud modem look positively nippy!

Group two faxes are analogue machines too and can simply be described as the turbo version of group one. Life-expired group two machines are readily available on the market, but before you consider purchase, you should see the output from the machine and perhaps even take a stopwatch to it. A page can take three or four minutes on a group two machine.

Group three brings with it the magic word digital. After the image is scanned in, the data is digitally

encoded. This group is the most common of the four and the most widely used. If you are planning to purchase a fax, fax card or fax modem, you should opt for one with group three capability. The extra cash that group three costs will magically pay itself back when Telecom sends its quarterly ransom demand. The only possible reason for buying a machine that supports group one or two is if you will regularly have to send a fax to someone who has a machine that can only support either of the earlier analogue protocols. Some group three machines and cards are backwards compatible, that is they will connect to group one and two machines. It's worth finding out whether or not the machine that you choose can communicate with earlier machines. If it can, you will gain the benefits of compatibility, but a group one or two machine can never hope to match the speed and resolution of later faxes. When you transmit to a lesser machine, you come down to its level of resolution and your transmission will be at the same speed as the slower machine.

A group three machine that conforms to the minimum standard for group three as laid down by CCITT will transmit the same document as a group one machine at least eight times as fast. Because the protocols are only a minimum requirement, some manufacturers have tweaked them to provide even faster and more error free transmission. A desktop fax can be capable of transmitting a page in less than 15 seconds. With the advent of digital read-encoding in group three the modified Huffman protocol was born. In simple terms, modified Huffman describes the way in which the scan data from the analogue scanner is

encoded and compressed for transmission along the phone wires.

If you buy a group three machine that has been tweaked by the manufacturer to offer more features than the group three requirement, you should be able to communicate with any other group machine but some of the tweaks may be manufacturer-specific. That is you may only reap the benefits of them if you are transmitting to a similarly equipped fax from the same manufacturer. If these features are noticeable in the price, it's worth considering whether you're ever going to get back what you paid for them.

Finally, group four is a pure digital system designed to work on ISDN digital networks. It hasn't reached the same spread or popularity as group three and, although it's quick efficient and productive, it looks as if group three will remain the de facto standard for the foreseeable future.

PRETTY AS A PICTURE

The resolution of a fax or any other processed document for that matter refers to the amount of detail in the picture. In a fax, the image is recreated a dot at a time. The number of dots per given distance is the resolution. The higher the number, the better the resolution. This magazine is produced through a Linotron typesetter that is capable of 1,270 x 1,270 dots per inch (dpi). An office laser copier or laser printer can support a resolution of about 300 x 300 dpi.

A group three fax machine has different horizontal and vertical resolution. The image generated consists of 98 vertical by 203 horizontal lines per inch. This means that a fax can contain more detail than the image on a computer screen, but isn't as good as a laser printer. A further development within group three is a 'fine' mode which doubles the vertical resolution to 196dpi. The image is 203 x 196 dpi which effectively doubles the resolution. Other methods of adding grey scales and halftones further enhance the image but at best, the output from a fax is very photocopy-like.

Group four, with its full digital protocol, will offer higher resolution and the research and development departments of the major fax producers have shown some almost photographic faxes but for now, we'll have to be satisfied with group three.

PAPER

With a stand alone fax, the choice is between plain and thermal paper. Most faxes use thermal paper which is a thin glossy paper covered with a transparent dye that turns dark when heated. The paper is expensive and doesn't offer a quality of copy that is pleasant to handle, but being on a roll means that it can support long documents. Standard A4 page width is the most common sized fax, but larger machines are available. A useful feature is a cutter which automatically cuts the paper at page breaks.

Plain paper fax machines produce faxes that look like photocopies and indeed use the same sort of paper as a photocopier. The technology that they use to produce the fax is similar to a photocopier with toner powder being attracted to a drum and then transferred to paper.

A computerised fax using, say, a PC with a fax/scanner card could produce its output to printer or file. The quality of the output depends on the printer, although using a 300x300dpi laser printer wouldn't increase the resolution beyond standard fax levels.

COMPUTER FAX

The recent idea of using the processing power of a computer with some extra hardware to allow it to output to a phone line in fax format wasn't enthusiastically received at first because of the difficulties encountered if the document to be faxed wasn't a file on the com-

puter. Cheap widely available scanners and optical character reading software have changed this and it's possible to perform all of the functions of a group three fax from your computer.

If you own a PC, you are well catered for. There are boxes that plug into the serial port of your PC with all the fax technology on board. This is a good solution if your expansion slots are filled but the widely available fax cards are tidier and a simpler integrated solution.

The PC fax card allows the computer to convert PC generated (or scanned) documents into modified Huffman code and send them directly down the phone to another fax machine.

Some PC fax cards serve more than one purpose with scanner or SCSI interfaces to allow the PC to interface with scanners and mass storage devices. The dual card is useful if expansion slots are at a premium. Optical character recognition software that works with a scanner can be useful to fax users too. This allows the user to scan a document and 'read' the text into a document on the computer rather than taking an image of the document.

Other machines such as the Macintosh are well catered for with fax peripherals, SCSI interfaces, etc, but home computers are limited in what's available. If you own a computer that doesn't have a wide variety of fax peripherals, all isn't lost. A fax modem connects to the serial port of the machine and there are already suites of software to allow Amiga and ST to connect to fax modems originally designed for the PC or Mac. The software isn't widely available in the UK yet, but if the US is anything to go by the Amigafax and STfax is just around the corner. For machines without a dedicated fax interface available or software to allow connection to a fax modem there is still a simple solution. It is generally possible to send ASCII data to a serial port and this in turn can be read by a fax machine that has a serial port as well. This doesn't limit you to expensive fax machines. Even some of the affordable Amstrad machines can do this. To put this ability to the test I prepared a document on a word processor first on a PCW and then on a CPC and had no problems sending them to a couple of fax machines. Of course, you've no way of receiving a fax on these systems and even on some of the well specified PC systems it becomes difficult as the incoming faxes are an image file and these take a lot of storage.

On board software can compress image files, but even after this, a single page could take up 70K of disk space. Thus a 14-page document could take a

THE RIGHT CONNECTION

There are three basic ways to use your computer with fax. The first and simplest is the traditional way. A document is output from the computer to a printer in the conventional way. It could be anything from a memo to a report or spreadsheet. This is then fed into the stand alone fax machine and the document is scanned and sent along the phone lines to the waiting fax at the other end. This method has the advantage that the computer isn't tied up in the sending of the fax which can be transmitted at a convenient time.

Secondly, some fax machines have a dedicated serial or user port that can be connected to a computer using a suitable cable. This allows basic text files to be sent in ASCII format from the computer to the fax and on to the recipient. Until this facility is more widely used and is expanded to cover high resolution bit image graphics it will be limited to ASCII text. There are a couple of systems which can take a suitable image file from a computer to transmit but as yet systems like these aren't common.

The third option is the dedicated computer fax. This can come as a card for a PC or a standalone fax modem. In its simplest form the software allows it to 'print' a data file to the fax in much the same way as the lead between a computer and fax allows this. With clever software and additional hardware though, it is becoming possible to emulate any feature of a fax with a computer. For example, there are PC fax cards that also include the ability to connect direct to a scanner. This allows you to scan a document in, process it with the fax software and output to printer and/or fax.

megabyte of hard disk space. A busy company receiving faxes to a PC from its salesforce could easily fill a 40Mb hard disk in a day, so the advantages of PC fax against a stand-alone machine should be considered.

COST

There's no hard and fast rule about what a fax machine will cost. In an afternoon travelling around Bristol, we found second-hand pre-group three faxes for as little as £120. A new fax machine of reasonable specification was on sale for £400. A couple of hundred pounds more and the features started to overtake the basic specification. Finally for a lofty £4,000, we were offered a machine that would send several documents to different numbers at pre-determined times while allowing other faxes to ring up and download from it. ■

• Nine different languages at the touch of a button are offered by Sharp Electronics' FO-2100.



Databases are the second most popular 'serious' program on the Amiga, after word processing. Basically, they're intended to store big catalogues of information and supply some kind of index system so that you can get at the information you need when you want to. This may seem a tad pointless, but it can be interesting and also useful if you have any big collections of information. You might want to make a catalogue of your record collection, for example, or hold details of your video library.

RECORD BREAKER

Information in a database is stored as a series of 'records' each of which has a number of fields to give further information about it. Each record in a video database, for instance, would be a video. (A record that's a video? Hang on a minute!) Each video record would be split into fields containing: first and foremost, the film's title; perhaps some kind of index number; the director; the star; year of release; running time.

Once you've got all the information in there, there are a couple of things you can do with it. First, you can sort it – which would be an easy way of putting the titles into alphabetical order, for instance, but if you were curious you might want to sort all your films according to year of release. By sorting on two different fields at the same time, you could put them into alphabetical order within each year.

Second, you can search. This allows you to pick out one particular record by looking for a unique quality (a video's title, for example) but also allows you to pick out a number that has something in common: all films that were directed by Paul Verhoeven, for example. Again, by searching on two fields you can find records that share the same qualities: all films made by Paul Verhoeven and starring a certain actor.

BUYING ADVICE

The problem of which package to go for must be resolved from two main considerations. Firstly, is it easy to use? It is pointless buying an "all-singing" package with a programming language if the person using it has no idea of how to program. Secondly, is it affordable? This will depend on individual resources. It is pointless saving money by buying a package incapable of the job demanded. Conversely, it is unwise to spend more money than needed.

These points apply to all software – especially that in the business sector. Make sure that the needs of the application are completely understood before searching for software to ease the task. Meanwhile, here's a run-down of the sub-£100 databases on the market.

MICROBASE (ANCO • £19.95)

For those on a budget there is only one choice, and although it comes from a company better known for its "adult" card games and one particularly infamous footy game, it performs surprisingly well. Anco's *MicroBase* is a true entry-level database with an entry-level price. It does nothing to rave about – but it is capable and solid. At the price, *MicroBase* is good value for money and an excellent introduction to databases.

AMIGA DATABASE



If you're not sure what a database is – or you know but are not sure what to do with one – Damien Noonan is here to help you with the best Amiga packages on offer.

K-DATA (KUMA • £49.95)

Claimed to be the best-selling flat-card system for the Amiga. Supplied on one disk, it comes in two versions – one for unexpanded A500s and an enhanced version for larger machines. The main fault with *K-Data* is its constant insistence on redrawing and moving windows which tends to make operation slow. Otherwise it is stable enough to be usable under most conditions.

SUPERBASE PERSONAL (PRECISION • £59.95)

This was the first database to use the revolutionary system of a control panel which resembles a video recorder. This not only allows the user to search through records very quickly, it is also a very easy system to learn. External fields allow graphics and text files to be attached to the database – *Superbase* supports all Amiga IFF graphic modes including HAM.

Three separate modes are available for editing and viewing data: Record view displays the records as a list of fields; Form view allows fields to be "dragged" freely around the screen; and Table view displays the data horizontally with the field names heading each column. Editing is not possible in Table view. *Superbase's* real power lies in its extensive reporting capability, which is unrivalled in this price bracket. This program has become de facto the leading Amiga database in many respects. It is very good.

MICROFICHE FILER (£69.95)

Features a clever interface: the idea is to locate records by scrolling a small magnification window over a larger sheet of "microfiche" – such as those found in libraries. When compared to traditional techniques, this concept seems strange initially, but it soon becomes second nature. *Microfiche Filer* is idiosyncratic in many ways. Nevertheless, its strengths far outweigh its weaknesses in most areas. This is an everyday database, tailored to simple jobs – fun to use and powerful enough for most home user tasks. Not one for the professional though.

PRODATA (ARNOR • £99.95)

Comes from the purveyors of the fine word processor *Protext*. Like *Protext*, *Prodata* is aimed at those users content with largely keyboard-based operations and is completely devoid of pop-down menus. That said, it is the most powerful of the flat-card databases and has the professional feel, a comprehensive manual, and support for dozens of printers. ■

Damien Noonan is editor of Amiga Format magazine. These articles are reprinted from his book, Get the Most Out of your Amiga, available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. Price £9.95.

THE ATARI ABC

Now, there's a PC-AT compatible that not only solves problems like other AT compatibles, it also solves the one problem that its predecessors have created ... affordability.

Silica Systems are pleased to present the new Atari ABC. The ABC is a 286 AT compatible that runs at over 5 times the performance of the IBM XT. This is achieved by combining the power and speed of a 16-bit 286 processor, with Atari Corp's development experience and engineering capabilities, which use the very latest in design technology. However, the Atari ABC's are available at 'XT prices' and many XT owners will wonder why they paid more, but got less!

The ABC is a reliable, high performance computer, built to exceptionally rigorous standards. It is well designed, to a state of the art specification, maintaining maximum expansion capability for the future. This includes up to 4Mb of RAM and 3 AT expansion slots. Plus, unusually for a PC at this price, the ABC has the ability to install two or three extra drives, with the cabling already inside the CPU.

The ABC has a host of impressive features, all built-in as standard, encouraging simple installation and ease of use. In addition, the ABC's small footprint and quiet operating, mean that you will notice it less on your desk than other PC's. Except, of course, when you begin to take advantage of its AT power.

At its remarkably low price point, the ABC is ideally suited for home, office and educational use and will take full advantage of the vast range of PC compatible software. And, with 12 months FREE on-site maintenance (8 hour response), you can rest assured that your ABC will be fully supported.

The ABC is the latest addition to a comprehensive range of both 286 (8Mhz or 12Mhz) and 386 (16Mhz and 20Mhz) PC's, from the Business Systems Division of Atari Corp. Atari's PC range offers an unsurpassed combination of reliability, compatibility and expandability, with unique features like Atari's 44Mb removable hard disk on their PC4. Return the coupon NOW for further details of the complete range of PC products from Atari's Business Systems Division.

**ABC
TURBO**
AVAILABLE: JUNE 90

To put the ABC even further ahead of the competition, we have introduced a special 'Turbo' version, which includes a super fast RLL hard disk controller to increase the data transfer rate from 150KBytes/s to 800KBytes/s, with a performance index of 4.801. Plus! to provide exceptional graphics with an outstanding colour resolution of up to 1024x768, we have included a Super VGA graphics adaptor and a 14" VGA colour monitor (which also supports 1024x768 resolution), all for an additional price of only £300. Check the ABC Turbo against the competition, at only £1299 (+VAT) with 30Mb hard disk, Super VGA colour graphics capabilities, plus 12 months on-site maintenance, it offers unbeatable value.

LOW PRICE - HIGH SPEC!

CPU+MOTHERBOARD	<ul style="list-style-type: none"> 8Mhz 80286 16-bit CPU Landmark Speed = 10.3Mhz, Norton SI Test = 9.0 Latest NEAT (New Enhanced AT) technology chip set Has user selectable bus, DMA speeds & wait states Programmable to operate at 0 or 1 wait states 640K RAM base memory (expandable) Motherboard expandable to 4Mb RAM memory Real time clock with battery back-up Full 16-bit data line capability Socket for 80287-8 numeric Co-Processor 3 16-bit AT expansion slots (max)
DISK	<ul style="list-style-type: none"> 32Mb RLL hard disk - 150KBytes/s transfer - 60ms access Fast disk controller - 800KBytes/s transfer - Turbo version 1.44Mb built-in 3 1/2" floppy disk drive Space for two 5 1/4" and two 3 1/2" drives (max)
I/O	<ul style="list-style-type: none"> Parallel port built-in (25-pin Centronics) Serial port built-in (9-pin RS-232) Mouse controller port built-in (9-pin serial)
GRAPHICS	<ul style="list-style-type: none"> Super VGA video graphics controller - 512K - Turbo vers Super VGA: 256 colours in 800x600 res - Turbo vers EGA video graphics controller built-in EGA: 16 colours available from a palette of 64 EGA: 256K of dedicated Video RAM built-in MDA, CGA and Hercules graphics controller built-in
PHYSICAL	<ul style="list-style-type: none"> Low noise operation Ergonomic small footprint (38cmx41cmx15cm) Keyboard - 102 key enhanced AT (12 function keys) Keyboard - has 2 position height adjusters
PLUS!	<ul style="list-style-type: none"> Fully OS/2 compatible (requires 4Mb RAM) Supports Industry Standard Networks MS-DOS 3.3 with GW BASIC 3.22 12 Months FREE on-site maintenance included

286 AT

WITH 30Mb HARD DISK & EGA MONITOR - £899

FREE! - ON-SITE MAINTENANCE

FREE! - TECHNICAL SUPPORT HOTLINE

FREE! - TEST/BURN-IN BEFORE DESPATCH

FREE! - OVERNIGHT COURIER DELIVERY

£899
WITH +VAT
**30Mb
HARD
DISK**
AND
**EGA
MONITOR**



**ABC
TURBO
£1299** EXC VAT
• SVGA COLOUR MONITOR
• SVGA GRAPHICS CARD - 512K
• 30Mb HARD DISK DRIVE
• FAST DISK CONTROLLER

£899 +VAT= £1033.85

ATARI

	3 1/2" FLOPPY DRIVE NO HARD DRIVE	3 1/2" FLOPPY DRIVE + 30Mb HARD DRIVE
NO MONITOR	£599 +VAT = £688.85	£799 +VAT = £918.85
+ EGA MONO	£699 +VAT = £803.85	£899 +VAT = £1033.85
+ EGA COLOUR	£799 +VAT = £918.85	£999 +VAT = £1148.85
ABC TURBO AVAIL: JUNE 90	• 14" SVGA COLOUR MONITOR • SVGA GRAPHICS ADAPTOR • FAST DISK CONTROLLER £1099 +VAT = £1263.85	£1299 +VAT = £1493.85

SILICA SYSTEMS OFFER YOU

ON-SITE MAINTENANCE (8 hour response): Available Free of Charge on all ABC's.
TECHNICAL SUPPORT HELPLINE: Team of Atari technical experts at your service.
100% QUALITY CONTROL: Every ABC is tested/burnt-in before despatch.
FREE OVERNIGHT COURIER DELIVERY: On all hardware orders shipped in the UK.
ESTABLISHED 12 YEARS: Proven track record in professional computer sales.
£13m TURNOVER (with 60 staff): Solid and reliable with maintained growth.
BUSINESS/EDUCATION/GOVERNMENT: Volume discounts available for large orders.
PRICE MATCH: We normally match competitors on a "Same product - Same price" basis.
SHOWROOMS: Demonstration and training facilities at our London & Sidcup branches.
THE FULL STOCK RANGE: All of your Atari PC requirements from one supplier.
FREE CATALOGUES: Will be mailed to you with offers and software/peripheral details.
PAYMENT: Cash / cheque / credit card / credit - we are licensed credit brokers - details on request.

Before you decide when to buy your new Atari ABC, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your ABC, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new ABC products? At Silica Systems, we ensure that you will have nothing to worry about. Silica Systems is a new division of Silica Shop, the UK's leading Atari specialists. This new division has been established to provide a service to the more serious home user, as well as to business and education purchasers. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now, for our latest Free literature and begin to experience the "Silica Systems Service".

**SILICA
SYSTEMS**



MAIL ORDER: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-309 1111
 Order Lines Open: Mon-Sat 9.00am-6.00pm No Late Night Opening Fax No: 081-308 0608
LONDON SHOP: 52 Tottenham Court Road, London, W1P 0BA Tel: 071-580 4000
 Opening Hours: Mon-Sat 9.30am-6.00pm Late Night: Thursday until 8pm Fax No: 071-323 4737
SIDCUP SHOP: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-302 8811
 Opening Hours: Mon-Sat 9.00am-5.30pm Late Night: Friday until 7pm Fax No: 081-309 0017
BUSINESS/EDUCATION: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-308 0888
 Order Lines Open: Mon-Fri 9.00am-6.00pm Closed on Saturdays Fax No: 081-308 0608

To: Silica Systems Ltd, Dept NCE 0291 28, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND INFORMATION ON ATARI PC's

Mr/Mrs/Ms: Initials: Surname:
 Address:

 Postcode:
 Tel (Home): Tel (Work):
 Company Name:
 Which computer(s), if any, do you own?

COMPETITION

WIN! WIN! WIN! WIN! WIN!

WIN!

COMPUSERVE SUBS WORTH OVER £650

Join Britain's the World's fastest growing on-line service with a great *Express* competition to make your modem glow with glee ...

Imagine Harrods, ASDA, Fortnums and a garage selling anything from a Robin to a Roller. Add a medical centre, several magazines and a forum for any subject under the sun and you have Compuserve. Compuserve is based in the US, but with local access nodes and a busy bustling UK office in cosmopolitan Bristol, it is gaining a distinctly European flavour.

The beauty of Compuserve lies in the fact that it has an answer for everything. If you need information, it's there. If you want to buy a car or a bunch of flowers it's there. *Express* logged on to Compuserve to see what it could do. We peeked in a couple of the many software download areas and worked out that there was enough software available to more than fill every hard disk in the office.

Compuserve must be in line for the title: "Biggest shop in the World" and it's as close to us all as a micro, modem and phone line. Compuserve is getting bigger too. When the UK on line service Microlink decided to close its doors, members were offered transfer to Compuserve thus giving it a readily established UK user base to add to its own users. Talk to anyone in the US

about comms and the chances are that they'll ask if you've a Compuserve account.

All you have to do to get a free registration worth £20, £12 of free on-line time and the necessary info to get on line is answer five simple questions about comms and complete a tiebreaker. The first 20 out of the editor's hat will get the on-line prizes. To make life even better, a winner's winner will be drawn and will receive an extra £25 worth of on-line time as well as some essential books on on-line services.

1) Where does the word MODEM come from?

- a) An abbreviation for Modulator/Demodulator
- b) It works in the protocol Mode M.
- c) It was invented by Dr Heinz Von Modemhof
- d) The inventor couldn't spell model

2) What is the biggest On-Line service available in the UK?

- a) Aspects BBS
- b) CIX
- c) Compuserve
- d) Express on Line

3) Which of these isn't to do with Modems

- a) 1200/75
- b) 8N1
- c) 386sx
- d) ATz

4) Which town with the dial code 0272 is Compuserve based in in the UK?

- a) Bristol
- b) Brighton
- c) Bridlington
- d) Great Dunmow

5) What is the range in miles of a 9600 baud Hayes compatible modem?

- a) 9600 miles
- b) 96000 miles
- c) 9600 kilometres
- d) As long as your phone bill

Fill in the coupon, stick it to the back of an envelope or postcard and send it to: I want to join the World's best on-line service competition, *New Computer Express*, 30 Monmouth Street, Bath BA1 2BW. ■

COMPUSERVE COMPETITION

- | | | |
|-----------------------------|-----------------------------|-----------------------------|
| 1) <input type="checkbox"/> | 2) <input type="checkbox"/> | 3) <input type="checkbox"/> |
| 4) <input type="checkbox"/> | 5) <input type="checkbox"/> | 6) <input type="checkbox"/> |

Name

Address

Cyberspace will never be built because

.....(no more than 15 words)

COMPUTER
EXPRESS
NEW

EDITOR • Andy Storer
DEPUTY EDITOR • Stuart Anderton
NEWS EDITOR • Colin Campbell
SUPPLEMENTS EDITOR • Tim Smith
TECHNICAL EDITOR • Keith Pomfret
PRODUCTION EDITOR • Julie Tolley
ART EDITOR • Amanda Cook
EDITORIAL ASSISTANT • Dave Golder
CONTRIBUTORS:
• Adam Waring • Hadyn Fitz-Williams
• Jason Holborn • Mary Branscombe
• Ken Coumarin • Sean Masterson
• Andy Hutchinson • Steve Patient
• Lucy Smith • Robin Alway • Ian Wrigley
• Steve Gold • Rod Lawton • Neil Jackson
CIRCULATION DIRECTOR • Sue Hartley
AD MANAGER • Helen Kirkhope

AD EXECUTIVES:
• Tim Partridge • Cheryl Beesley
• Siobhan Kennedy-Coyne
AD PRODUCTION • Frances Wasem
AD TYPESETTING • Terry Turner
PUBLISHER • Graeme Kidd
ABC audited circulation
January-June 1990:
21,251 copies per week
We regret we cannot enter into any personal correspondence. Technical enquiries should be addressed to Tech Tips at the address below.
While every care is taken in the preparation of *New Computer Express*, Future Publishing cannot be held responsible for the consequences of any

errors that may occur.

• Subscriptions: The Old Barn, Somerton, Somerset (0458) 74011
• Printed by Redwood Press, Melksham, Wilts
• Distributed in UK and Eire by MMC Ltd (0483 211222), rest of world by Comag (0895 444055)

© Future Publishing Ltd
30 Monmouth Street, Bath BA1 2BW
Tel: 0225 442244 • Fax: 0225 446019
E-mail:
CIX @ astor (or conference 'Express')
GOLD @ 84:TXT152
COMPUSERVE @ 100012, 1075
PRESTEL @011112623

COMING NEXT THURSDAY

286 or 386SX?

Are the new SX machines worth the extra cost?

Pagestream 2

Is this the new King of Amiga DTP?

Making the Most

The beginners' guide to the ST & Amiga moves on to the best spreadsheets for your machine

PLUS

- Hot news
- Accurate analysis
- Front End
- Games Week
- Whole Wired World
- Centrefold
- Tech Tips
- Circuit City
- Express On-line
- Express Mail
- The PD Column
- Programming
- Columns for: Amiga, Archimedes, CPC, C64, Macintosh, PC, Spectrum and ST

Another super duper competition

ON SALE AT
YOUR
NEWSAGENT
ON THE 14th

RETURN THE COUPON FOR FREE COLOUR BROCHURES!

NEW! - AMIGA PACK

Commodore A500
Flight Of Fantasy

£399

INC VAT



A500 BATMAN PACK



The Commodore A500 Batman Pack must surely rank as one of the most popular computer packs ever! The pack features the Commodore Amiga 500 computer with mouse controller and TV modulator, plus four top software titles. The software includes: 'Batman The Movie' - Rid Gotham City of the cunning joker, in Ocean's top selling title based on the blockbuster Batman film; 'New Zealand Story' - high quality conversion of the leading arcade game; 'Interceptor' - Dogfight with two F-16's in this leading flight simulator; 'Deluxe Paint II' - top quality Amiga graphics package which set the standard for others to follow. Return the coupon for further details.

PACK INCLUDES:

A500 Computer & Mouse	£399.99
A520 TV Modulator	£24.99
Batman The Movie	£24.95
New Zealand Story	£24.95
Interceptor	£24.95
Deluxe Paint II	£49.95

TOTAL RRP: £549.78
Less Pack Saving: £150.78

PACK PRICE: £399.00

£399 INC VAT

AMIGA 2000



For the more serious or professional applications user, Commodore have a selection of systems based around the expandable Amiga 2000, at prices from £1295+VAT. The A2000 features a full 1Mb RAM (expandable to 9Mb), 9 system expansion slots, plus IBM compatibility with the use of PC-XT or PC-AT bridgeboards. Complete and return the coupon, putting a tick in the A2000 box, for details of A2000 computer systems.

£1295
+VAT= £1489.25

FLIGHT OF FANTASY

Flight of Fantasy is the very latest Amiga 500 pack from Commodore, featuring BRAND NEW software releases, to make this the most spectacular A500 pack ever! The pack features the Amiga 500 computer with mouse controller and TV modulator, as well as four top software titles. These include the following:

DELUXE PAINT II:

The high quality graphics program that set the standard for other Amiga art packages. Deluxe Paint II includes powerful, easy to use tools that bring out the artist in you. Create masterpieces, presentations, 3D perspectives or just doodle.

ESCAPE / ROBOT MONSTERS:

Here's something completely different - a science fiction story with comic book style graphics. Our heroes Jake and Duke are on the Planet X rescuing Humans who have been captured by the Robot Monsters and forced to create an evil Robot Army to DESTROY EARTH! Jake and Duke fight their way through hordes of evil Robots to help the Humans escape.

RAINBOW ISLANDS:

Slip on your magic shoes, practise throwing a rainbow and you're ready to go island hopping. From the Island of Doh to Monster Island, you will encounter Doh himself, stinging insects, lethal combat machines, mechanical assailants, the formidable beings of legend and folklore. Finally enter the world of darkness and its inhabitants.

F29 RETALIATOR:

The ultimate in flight simulation with a choice of two aircraft and four battle environments with dozens of different tactical missions. Aerial combat, strategic bombings, interactive ground based battles, seagoing carriers... the list of features is endless. Real time cockpit displays, including 'true radar' enhance the realistic feel of this stunning simulation.

PACK INCLUDES:

A500 Computer & Mouse	£399.99
A520 TV Modulator	£24.99
Deluxe Paint II	£49.95
Escape/Robot Monsters	£19.99
Rainbow Islands	£24.95
F29 Retaliator	£24.95

TOTAL RRP: £544.82
Less Pack Saving: £145.82

PACK PRICE: £399.00

£399 INC VAT

FOR FURTHER DETAILS OF THE AMIGA RANGE, COMPLETE THE COUPON AND RETURN IT TO SILICA SHOP
THE UK's No1 AMIGA SPECIALISTS

SILICA SHOP OFFER YOU

FREE OVERNIGHT COURIER DELIVERY: On all hardware orders shipped in the UK.
TECHNICAL SUPPORT HELPLINE: Team of Amiga technical experts at your service.
PRICE MATCH: We normally match competitors on a "Same product - same price" basis.
ESTABLISHED 12 YEARS: Proven track record in professional computer sales.
£13M TURNOVER (with 60 staff): Solid and reliable with maintained growth.
BUSINESS/EDUCATION/GOVERNMENT: Volume discounts available for large orders.
SHOWROOMS: Demonstration and training facilities at our London & Sidcup branches.
THE FULL STOCK RANGE: All of your Amiga requirements from one supplier.
FREE CATALOGUES: Will be mailed to you with offers and software/peripheral details.
PAYMENT: By cash, cheque and all major credit cards.
CREDIT PAYMENT TERMS: Silica are licensed credit brokers - return coupon for details.

Before you decide when to buy your new Amiga computer, we suggest you think very carefully about WHERE you buy it. Consider what it will be like a few months after buying your Amiga, when you may require additional peripherals or software, or help and advice with your new purchase. And, will the company you buy from contact you with details of new products? At Silica Shop, we ensure that you will have nothing to worry about. Silica have been established for over 12 years, and have an annual turnover of £13 million. With our unrivalled experience and expertise, we can now claim to meet our customers requirements with an understanding which is second to none. But don't just take our word for it. Complete and return the coupon now for our latest Free literature and begin to experience the "Silica Shop Service".

RETURN THE COUPON NOW FOR
FREE BROCHURES

SILICA SHOP

MAIL ORDER: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-309 1111
Order Lines Open: Mon-Sat 9.00am-6.00pm No Late Night Opening Fax No: 081-308 0608

LONDON SHOP: 52 Tottenham Court Road, London, W1P 0BA Tel: 071-580 4000
Opening Hours: Mon-Sat 9.30am-6.00pm Late Night: Thursday until 8pm Fax No: 071-323 4737

SIDCUP SHOP: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-302 8811
Opening Hours: Mon-Sat 9.00am-5.30pm Late Night: Friday until 7pm Fax No: 081-309 0017

BUSINESS/EDUCATION: 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX Tel: 081-308 0888
Order Lines Open: Mon-Fri 9.00am-6.00pm Closed on Saturdays Fax No: 081-308 0608

To: Silica Systems Ltd, Dept NCE 0291-32, 1-4 The Mews, Hatherley Rd, Sidcup, Kent, DA14 4DX

PLEASE SEND INFORMATION ON THE AMIGA

Mr/Mrs/Ms: Initials: Surname:

Address:

Postcode: Tel:

Which computer(s), if any, do you own? A2000 ☐

EA0E - Advertised prices and specifications may change - please return the coupon for the latest information.

A NEW WORLD OF POWER

THE ANSWER
TO YOUR
DISK
DUPLICATION
PROBLEMS

FOR ONLY

£34.99

THE

SYNCR0 EXPRESS II

IS HERE!

- SYNCRO EXPRESS IS A HIGH SPEED DISK DUPLICATION SYSTEM THAT WILL PRODUCE COPIES OF YOUR DISK IN AROUND 50 SECONDS!!
- Syncro Express requires a second drive & works by controlling it as a slave device & ignoring the ST or Amiga disk drive controller chip whereby high speeds & great data accuracy are achieved.
- Menu driven selection for Start Track/End Track - up to 80 tracks. 1 side, 2 sides.
- Very simple to use, requires no user knowledge.
- Also duplicates other formats such as IBM, MAC etc.
- Ideal for clubs, user groups or just for your own disks.
- No more waiting around for your disks to copy.
- Probably the only duplication system you will ever need!

THE LATEST CUSTOM LSI CHIP TECHNOLOGY

By using an on-board Custom LSI Chip, Syncro Express has the power to transfer an MFM image of the original disk directly to your blank disk - quickly, simply and without any user knowledge. One external disk drive is required*.



SYNCRO EXPRESS IS AVAILABLE FOR BOTH THE ST AND AMIGA SYSTEMS - PLEASE STATE WHICH REQUIRED WHEN ORDERING

WARNING 1988 COPYRIGHT ACT WARNING

Datel Electronics Ltd., neither condones nor authorises the use of its products for the reproduction of copyright material.
The backup facilities of this product are designed to reproduce only software such as Public Domain material, the users own programs or software where permission to make backups has been clearly given. It is illegal to make copies, even for your own use, of copyright material, without the express permission of the copyright owner, or the licensee thereof.

If you don't have a second drive we can supply
SYNCRO EXPRESS together with a drive for
ONLY £104.99 (AMIGA)
ONLY £119.99 (ST)

HOW TO GET YOUR SYNCR0 EXPRESS II
TELEPHONE (24 Hrs) - 0782 744707 - CREDIT CARD ORDERS

WE WILL DESPATCH YOUR ORDER QUICKLY & EFFICIENTLY TO ENABLE YOU TO START RECEIVING THE BENEFITS OF YOUR PURCHASE WITHIN DAYS, NOT WEEKS.

ORDERS NORMALLY DESPATCHED WITHIN 48 Hrs. ALL CHEQUES/POSTAL ORDERS MADE PAYABLE TO...



DATTEL ELECTRONICS LTD.,



GOVAN ROAD, FENTON INDUSTRIAL ESTATE, FENTON, STOKE-ON-TRENT, ST4 2RS, ENGLAND
TECHNICAL/CUSTOMER SERVICE 0782 744324

FREE

COMPUTER EXPRESS

AN EXPRESS SUPPLEMENT

FREE WITH NEW COMPUTER EXPRESS 118
NOT TO BE SOLD SEPARATELY

MUSIC GUIDE

How the professionals do it

All you need to know to set up a music system around *your* computer -

- 🎵 Hardware Guides
- 🎵 Software Guides
- 🎵 Peripherals

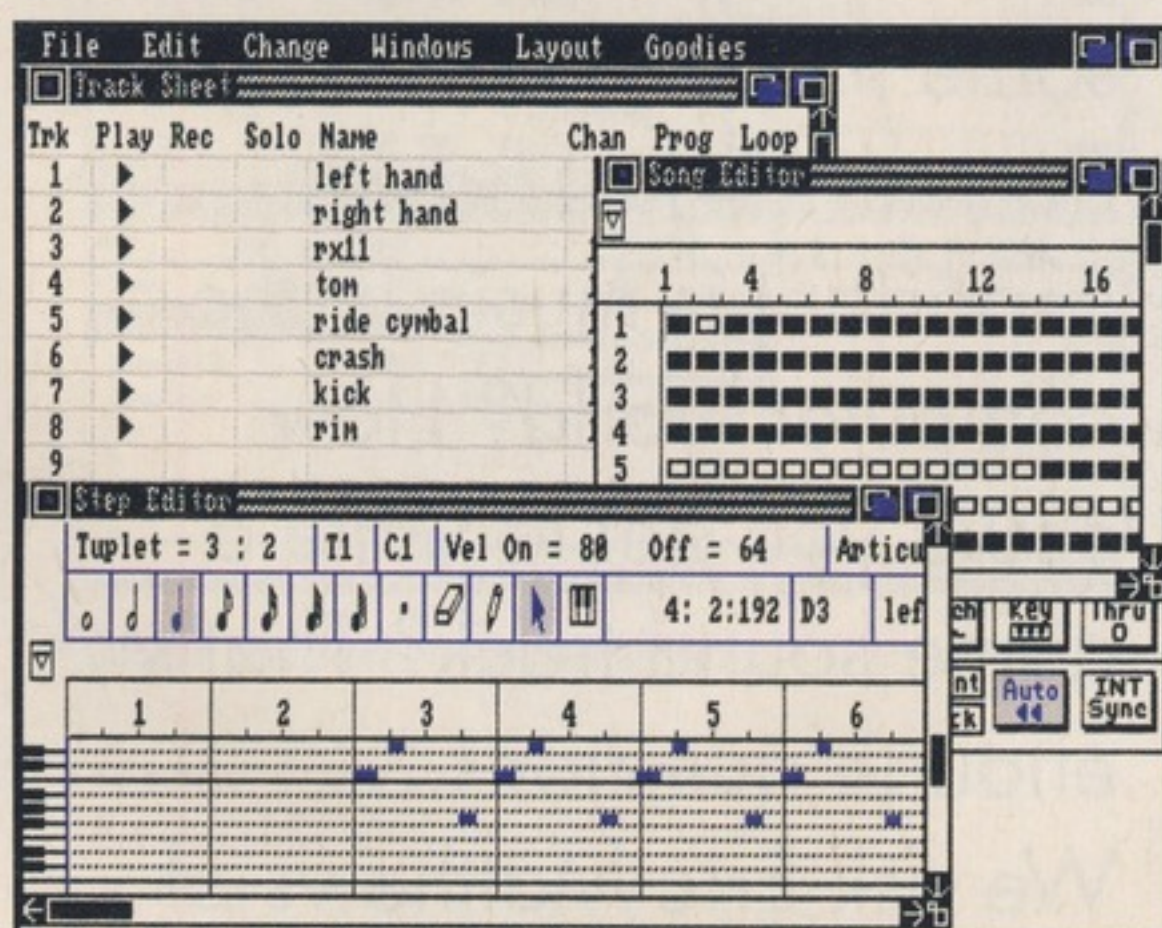
What exactly is MIDI?
The mystery explained

Top of the scale? Express investigates
the £400,000 Synclavier dream machine

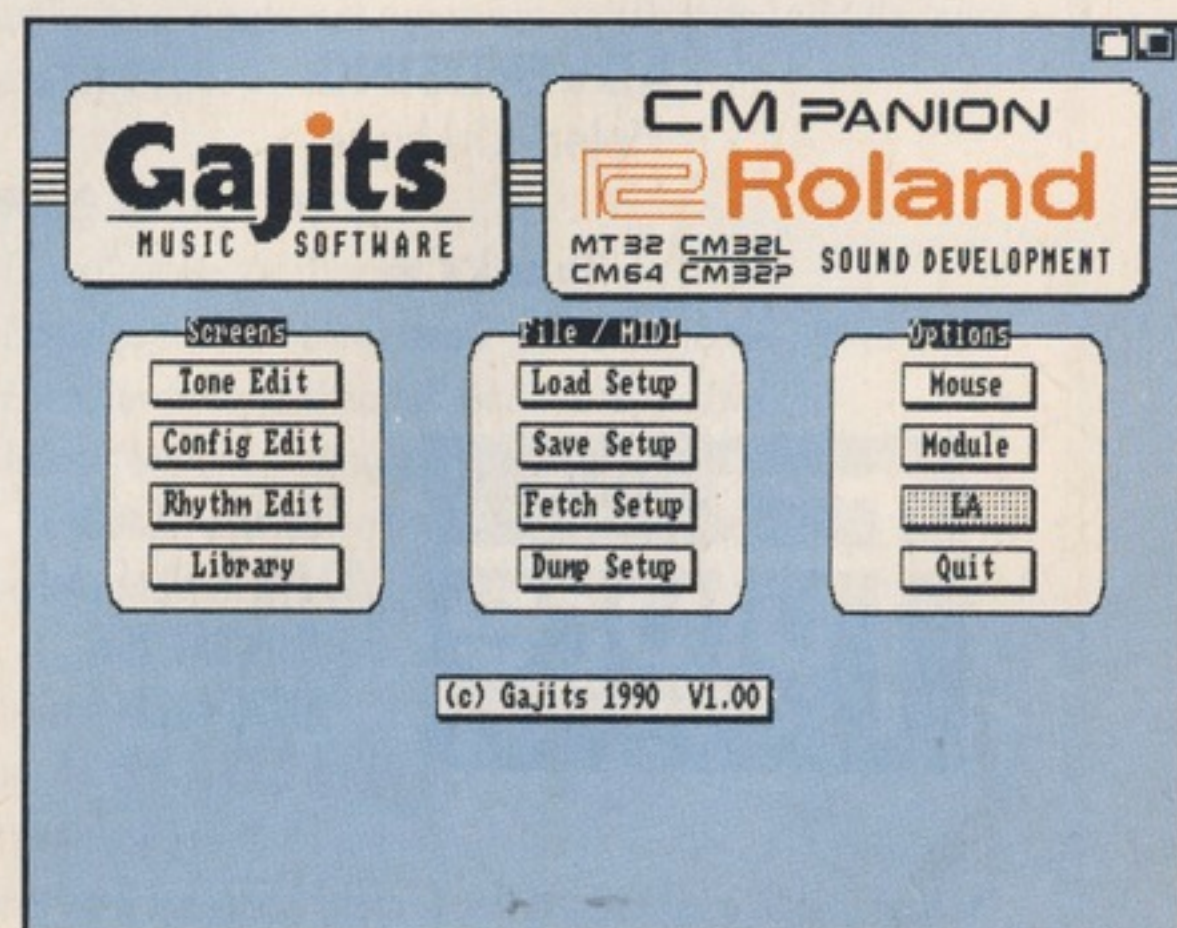
WIN
a keyboard
worth £300



Samplers...



...Sequencers...



...Synthesisers

AT-A-GLANCE GUIDE - OVER 70 PROGRAMS LISTED

Welcome to the *New Computer Express Music Guide*.

Computers have been derided as being too clinical to be involved in the art of music making. Recently however, such tricks as sampling, synthesising and digital recording have opened new horizons for even the humblest micro.

The chances are that the computer you have at home or at work – even the one you are thinking of buying – has the capacity to help you express your musical ideas and unleash your creativity.

This guide aims to introduce you to some of the many software, hardware and peripheral options open to you. We have tried to include as many reviews of products currently on the market as space would allow. And just to give a hint at what could be on your desk in another ten years try looking at the Synclavier '9600 system on page 20. Cost? £400,000 and worth every penny piece...

EDITOR
Tim Smith

CONTRIBUTORS

Jon Bates, Damien Noonan, Maff Evans,
Keith Pomfret, Stuart Anderton

ADVERTISING
Helen Kirkhope

Thanks to

Julie Tolley, Amanda Cook, Dave Golder, Martyn Lester,
Francis Wasem and Simon Windsor



Beauford Court
30 Monmouth Street
Bath BA1 2BW
0225 442244

The Music Guide is a supplement to New Computer Express and is not to be sold separately. So don't even think about it!
© 1991 Future Publishing. All rights reserved. No part of this publication may be reproduced without the prior permission of the publisher. In writing.

CONTENTS

A symphony of software

We take a look at the current crop of music software for the home computer. An overview of more than 70 programs in one easy guide

Pages 3, 4, 5, 6, 7, 9

The musical micro

You might think that your computer is the best, but how does it rate as a music machine?

Pages 10, 11

Jargon explained

We're obviously going to have to use a lot of unfamiliar terms, but that doesn't mean that you have to be left in the dark. Do the knowledge...

Page 12

Chasing the charts

Now that you've made some music what can you do with it? Just how important is music in the computer world? How could you get to write a game sound track? That's enough questions...

We ask Eric Matthews of Renegade for the answers

Page 14

Amiga adagio

A run-down on the Amiga as an instrument...

Page 16

Musical add-ons

Your guide to the best music accessories

Pages 18, 19, 20

Music in the machine

The tunes your machine can play solo...

Pages 22, 23

MIDI demystified

That Musical Instrument Digital Interface in full...

Pages 24, 25

Tame that tune

A step-by-step guide to writing computer music

Pages 27, 28

WIN!

A £300

MIDI

keyboard

A Cheetah Master Series is up for grabs.

Page 30

A Symphony of Software

You have the hardware. You have the best-selling tune in your head. Now choose your software. We take a look at the best and the rest of the packages around.

What follows is a brief summary of most of the music software currently available; we simply didn't have space for everything. The main thing to look out for is upward compatibility, or to put it another way, "Can I expand and improve on the software I have without throwing away what I have already done?". One way that soft-

ware developers have tried to do this is with 'multiple environments' where several programs can co-exist and be called to the fore as required. If the programs are from the same stable or there has been some friendly agreement between software developers then it is likely that alterations made may well be noted in the other programs. Even if this is not the

case, the additional software will hang around as a desk accessory. Two companies: Dr T and Steinberg have their own environments called *MPE* and *MROS* respectively. Another company, C-Lab has *Softlink*. All three are working towards some mutual compatibility for peaceful co-existence under one computer. Good software developers

will provide upgrading software for existing owners at reasonable prices. With programs interlocking like this, the spectre of incompatibility diminishes considerably.

All prices quoted are the RRP and should be taken as a guide only. You may be lucky and get a discount deal, or you might find that the price has risen due to an upgrade.

MIDI Sequencers

Perhaps the best known type of music software, MIDI sequencers come in all shapes and sizes, from the Public Domain to those mega expensive versions that dominate the professional music world and are replete with infinite editing facilities. The usual mark of excellence is ease of use coupled with hosts of labour-saving musically intelligent routines.

Ideally, sequencer software will also be able to save in MIDI file format so that work on one sequencer can be transferred to another without tears. We've tried to include most of the favourites on the market but drew the line at professional scoring packages.

Creator/Novator v.03
For Atari ST 1040/Mega ST
From C-Lab (Sound Technology)
Tel: 0462 480000
Price £289/£495

One of the most widely used of sequencers, *Creator 3* has many new editing and arranging features that enable you to draw in velocity curves and drum patterns. It also has advanced intelligent quantize features. It can be expanded with hardware to control up to 96 MIDI channels independently. Notator is the score printing version, which has been updated too.

PROS AND CONS

- + MIDI file compatibility
- + SMPTE read and generate facilities
- + Manual now radically re-written and logical
- + Can interact with other software
- Expensive
- Doesn't have multi-window facility which is fast becoming popular on sequencers of this type.

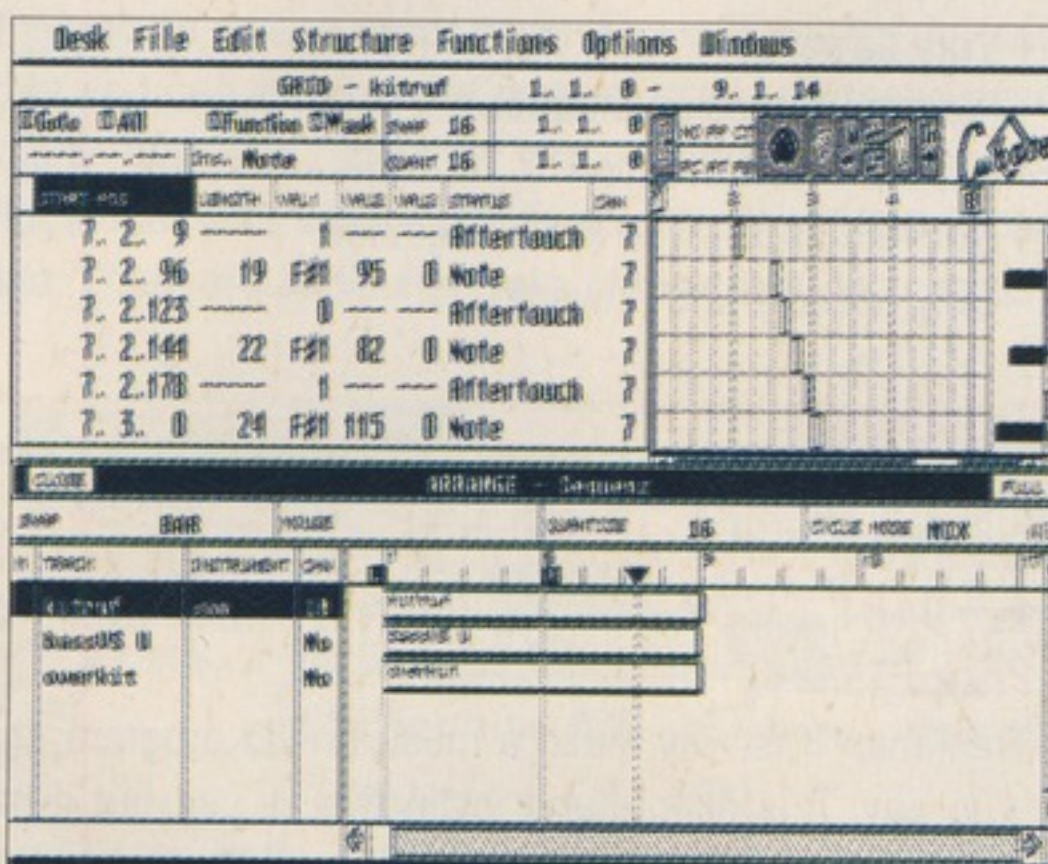
Cubase v2/Cubeat
For Atari ST 1040/Mega ST and Macintosh
From Evenlode

Tel: 099 389 8484
Price £475/£299

Very popular amongst the professional users, it has multiple window environment and a very simple arrangement page. Clever software modules send out set-up data and sounds for synths and it will multi-task with other programs. *Cubeat* is the cut-down version.

PROS AND CONS

- + Very easy to use
- + Has a whole armoury of slick features
- + Multiple window environment makes it very quick in operation
- + Can have SMPTE read/generate and multiple channel add-ons
- + Can interlink with word processor and control Fostex multi-track tape machines
- Price
- Could be too detailed for the beginner.



Cubase shows off its multiple windows

Omega
For Atari ST
From Dr T
Tel: 081 963 0663
Price £299

Brand new sequencer that combines the graphic features of *TigerCub* along with the capacity of KCS Level 2. It supports the Multi Program Environment and will also interact with certain other ST music software. 48 tracks plus a powerful song arrange feature.

PROS AND CONS

- + Has many advanced features
- + Will run with many other programs on-board (provided you have the memory and the right programs)
- + Can be expanded up to 64 MIDI channels
- + High level of accuracy
- Not cheap
- So new it hasn't had a full testing yet.

Prism
For PC
From Digital Music
Tel: 0703 252131
Price £109

16 track sequencer with neat, quick way of working and smart presentation à la Macintosh. Uses graphics to control velocities and other MIDI parameters and has been well-liked by all who have used it. Digital Music do a neat package deal of this plus a MIDI interface for £189.

PROS AND CONS

- + Good value for money
- + Easy to use
- + Excellent manual
- + Importers offer excellent package with interface
- Software house only make one other (excellent) sequencer which might make upgrading awkward.

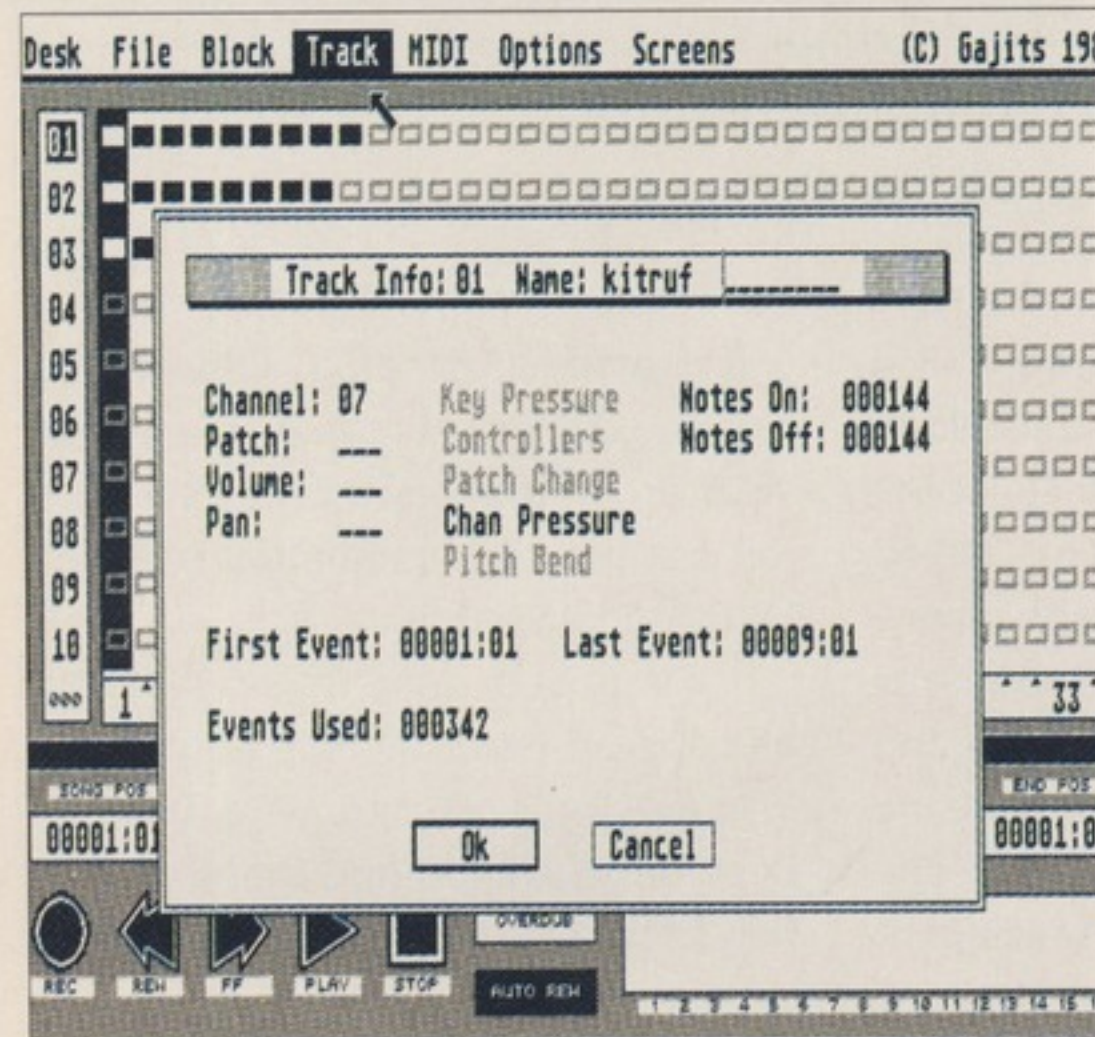
Sequencer 1
For All ST's and Amiga
From Gajits
Tel: 061 236 2515
Price £89

Well-priced 32 track sequencer that serves as an excellent introduction to sequencing. Short patterns

can be earmarked as blocks and moved around and there is a cue list for the blocks on the main screen. Editing individual notes is a little time-consuming but bearable. The Amiga version allows you to use the internal voices.

PROS AND CONS

- + Good value for money
- + Good editing that is easy to see and cope with
- + Good arrange feature
- + Supports Midi File
- + Cue list
- + Runs on ST520 and A500
- Does require data entered from the keyboard at times.



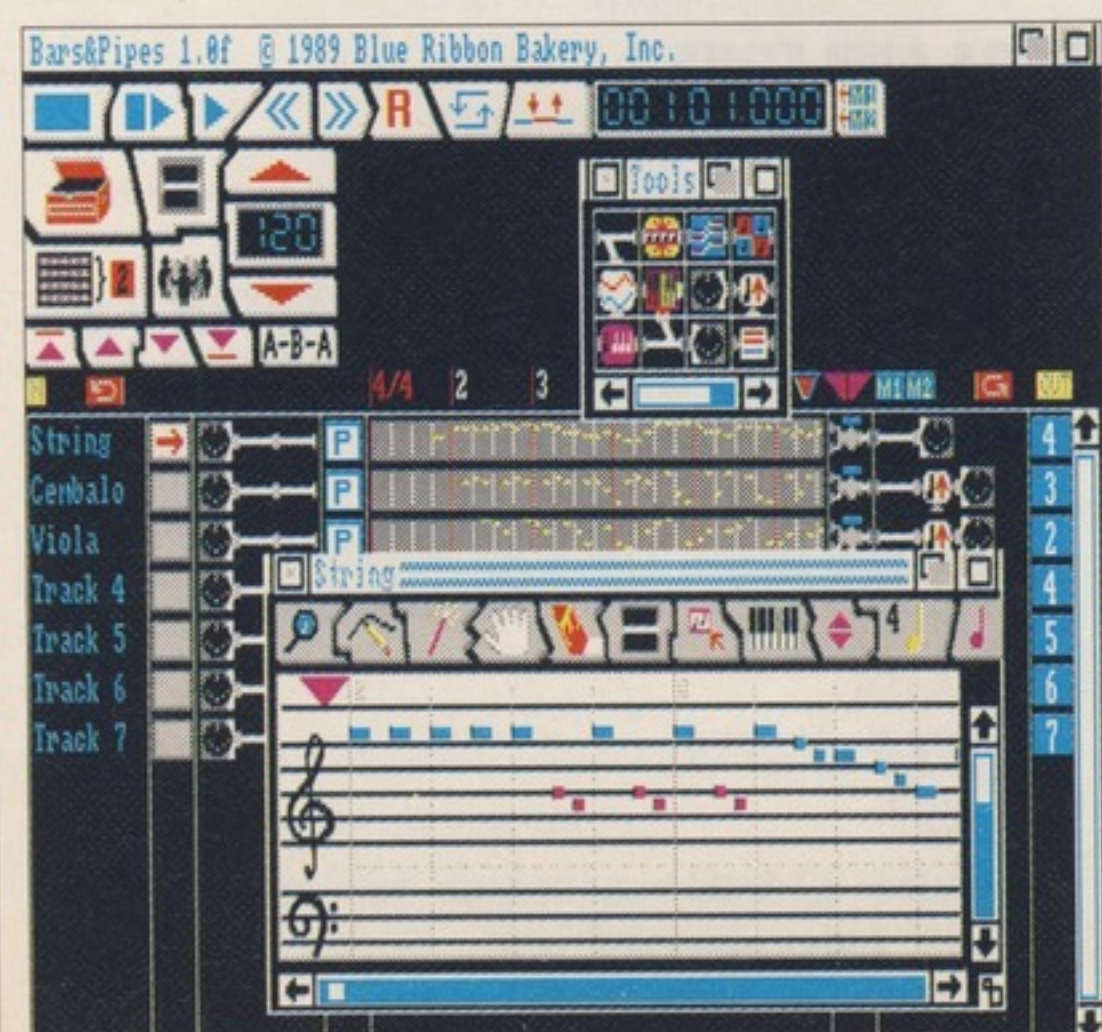
Block editing with Sequencer 1

Bars and Pipes 1.0f
For All Amigas with 1Mb memory
From Precision Software or Newtronic
Tel: 081 330 7166/081 659 0744
Price £219.95

Highly original program that has very good graphic approach to sequencing, routing the data literally through on-screen water pipes. Music Tools are devices that you can insert in the data 'stream' and these have many functions, some of which generate new music lines from your input, provide echo facilities, harmonise etc. There are additional disks of tools that you can buy which include using the internal voices. Professional and Junior versions are planned.

PROS AND CONS

- + Simple to use
- + Lots of very musical features
- + Add-ons available
- + Can handle lyrics and print outs
- + Can cope with 80 MIDI channels
- Not cheap
- Note editing not too hot



- Definitely needs colour monitor

Cosh Sequencer
For All ST's
From All good PD Libraries
Price £2 - £4 approx.

Really quite amazing value for money, as the *Cosh Sequencer* is a superb piece of software that has advanced features such as tempo change coupled with good graphic editing, track listing, punch in and out, track copying, and quantizing. You wonder where the strange name came from? Well violence is not involved as it was named after its programmer, Henry Cosh.

PROS AND CONS

- + Price
- + Well thought-out program
- + Full manual on disk
- + Many features
- Some slight idiosyncrasies in operation.

Quartet
For Amigas/ST
From Microdeal
Tel: 0726 68020
Price £24.95

Interesting sequencer that uses internal voices but can also output MIDI in each track. Makes a handy place to start. It will also work with IFF samples (Amiga Version). - Amiga version is an improvement on SY version.

PROS AND CONS

- + Cheap
- + Supports MIDI and internal sounds
- + Very visual
- Editing features not too good
- A bit basic as sequencers go.

Musician
For All Amigas
From Thalamus
Tel: 0734 81726
Price £29.99

Very powerful program that can squeeze that last drop of sound from the internal chip as well as editing samples. Excellent graphics help you to do this as well as some rather slick routines. Sequencing is with strings of data, again with smart routines to help you.

PROS AND CONS

- + Price
- + Very powerful
- + Ideal for games soundtracks
- + Superb sound creation
- Not very good if you are a beginner
- Only accepts MIDI inwards.

Trackman II
For All ST's
From First Rate Ltd
Tel: 0481 23169
Price £199

Trackman II is very much a musician-led program; that is to say, it is simple and instinctive to use but it has many advanced features should you choose to call them in. Auto mixdown, full MIDI control and drum maps among other facets, plus interaction with Midiman, the universal editor.

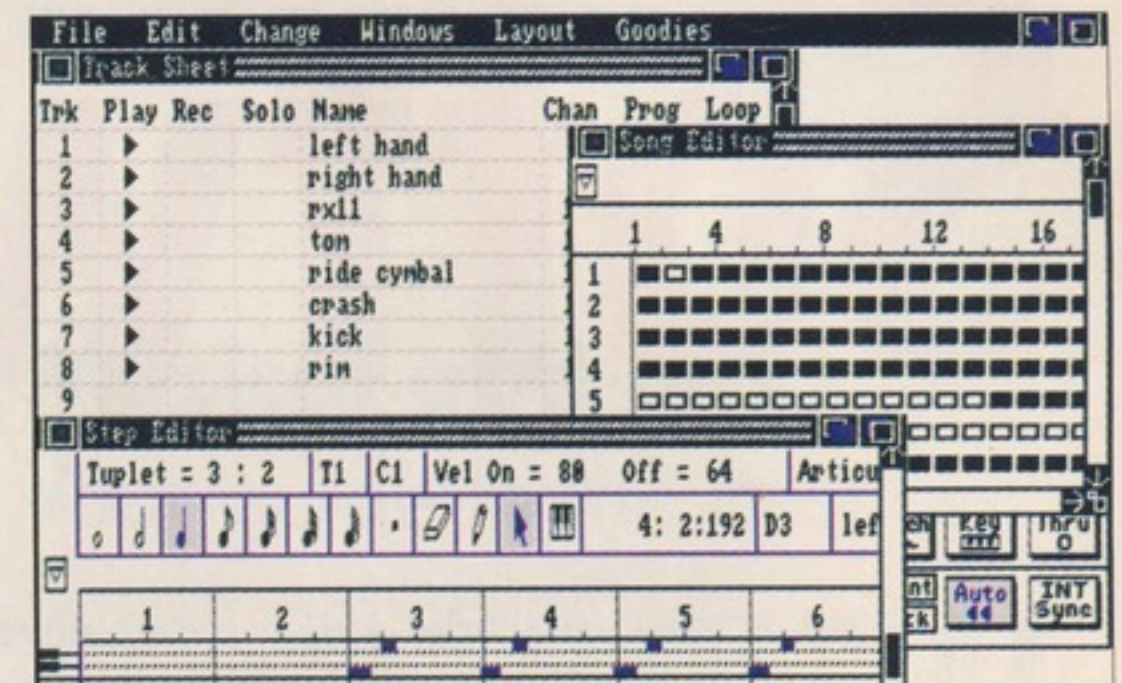
PROS AND CONS

- + Lots of facilities
- + Very easy to understand and use
- + Loads Midi Files
- + Good and simple editing

- Initial price.

Trax
For Macintosh /PC/Amiga/ST
From Passport
Tel: 081 963 0663
Price £99

Nice entry-level sequencer with Macintosh type display using multiple windows. Easy to use and understand with song edit function.



Multiple windows are just one aspect of Trax

PROS AND CONS

- + Price
- + Easy to use
- + Multiple window
- Editing not very quick
- Can't expand beyond 16 MIDI channels.

Prodigy
For Atari ST 1040
From The Digital Muse/Audio Software
Tel: 071 586 3445
Price £129

32 track cut-down version of Virtuoso which has some very fast features including 'piano roll' style editing and advanced quantize. It takes a little bit of getting used to but the promised add-ons, like scoring packages and GEM compatibility, go some way to making up for this, and reward the time spent.

PROS AND CONS

- + Very fast - thanks to re-writing of screen management
- + Accurate
- + Can perform disk operations whilst still running
- + Can upgrade to Virtuoso
- Editing could be smarter.

Beyond V2
For Macintosh
From Dr T
Tel: 081 963 0663
Price £259

99 track sequencer with high resolution accuracy and some interesting harmonization and 'humanization' routines plus good editing.

PROS AND CONS

- + Many professional features
- + Graphic editing and display
- + Can be expanded to run 512(!) MIDI channels
- + Auto mixdown
- + Easy to use
- No notation or data editing
- Not cheap.

Harmoni
For All Amigas
From The Disk Company
Tel: 010 331 4910 9995
Price £49.99

Well-priced Amiga sequencer that has quite a few up-market features. Included for your musical pleasure are

Creator/Novator v.03
For Atari ST 1040/Mega ST
From C-Lab (Sound Technology)
Tel: 0462 480000
Price £289/£495

One of the most widely used of sequencers, *Creator 3* has many new editing and arranging features that enable you to draw in velocity curves and drum patterns. It also has advanced intelligent quantize features. It can be expanded with hardware to control up to 96 MIDI channels independently. Notator is the score printing version, which has been updated too.

PROS AND CONS

- + MIDI file compatibility
- + SMPTE read and generate facilities
- + Manual now radically re-written and logical
- + Can interact with other software
- Expensive
- Doesn't have multi-window facility which is fast becoming popular on sequencers of this type.

Cubase v2/Cubeat
For Atari ST 1040/Mega ST and Macintosh
From Evenlode
Tel: 099 389 8484
Price £475/£299

Very popular amongst the professional users, it has multiple window environment and a very simple arrangement page. Clever software modules send out set-up data and sounds for synths and it will multi-task with other programs. Cubeat is the cut-down version.

PROS AND CONS

- + Very easy to use
- + Has a whole armoury of slick features
- + Multiple window environment makes it very quick in operation
- + Can have SMPTE read/generate and multiple channel add-ons
- + Can interlink with word processor and control Fostex multi-track tape machines
- Price
- Could be too detailed for the beginner.

Omega
For Atari ST
From Dr T
Tel: 081 963 0663
Price £299

Brand new sequencer that combines the graphic features of *TigerCub* along with the capacity of KCS Level 2. It supports the Multi Program Environment and will also interact with certain other ST music software. 48 tracks plus a powerful song arrange feature.

PROS AND CONS

- + Has many advanced features
- + Will run with many other programs on-board (provided you have the memory and the right programs)
- + Can be expanded up to 64 MIDI channels
- + High level of accuracy
- Not cheap
- So new it hasn't had a full testing yet.

Prism
For PC
From Digital Music
Tel: 0703 252131
Price £109

16 track sequencer with neat, quick way of working and smart presentation à la Macintosh. Uses graphics to control velocities and other MIDI parameters and has been well-liked by all who have used it. Digital Music do

a neat package deal of this plus a MIDI interface for £189.

PROS AND CONS

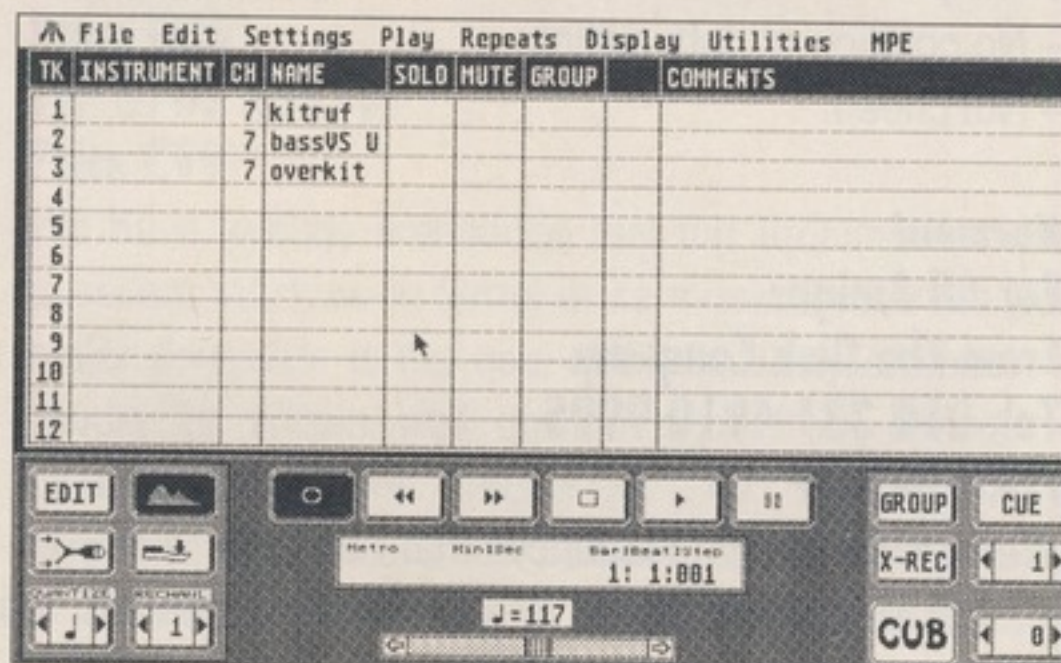
- + Good value for money
- + Easy to use
- + Excellent manual
- + Importers offer excellent package with interface
- Software house only make one other (excellent) sequencer which might make upgrading awkward.

Sequencer 1
For All ST's and Amiga
From Gajits
Tel: 061 236 2515
Price £89

Well-priced 32 track sequencer that serves as an excellent introduction to sequencing. Short patterns can be earmarked as blocks and moved around and there is a cue list for the blocks on the main screen. Editing individual notes is a little time-consuming but bearable. The Amiga version allows you to use the internal voices.

PROS AND CONS

- + Good value for money

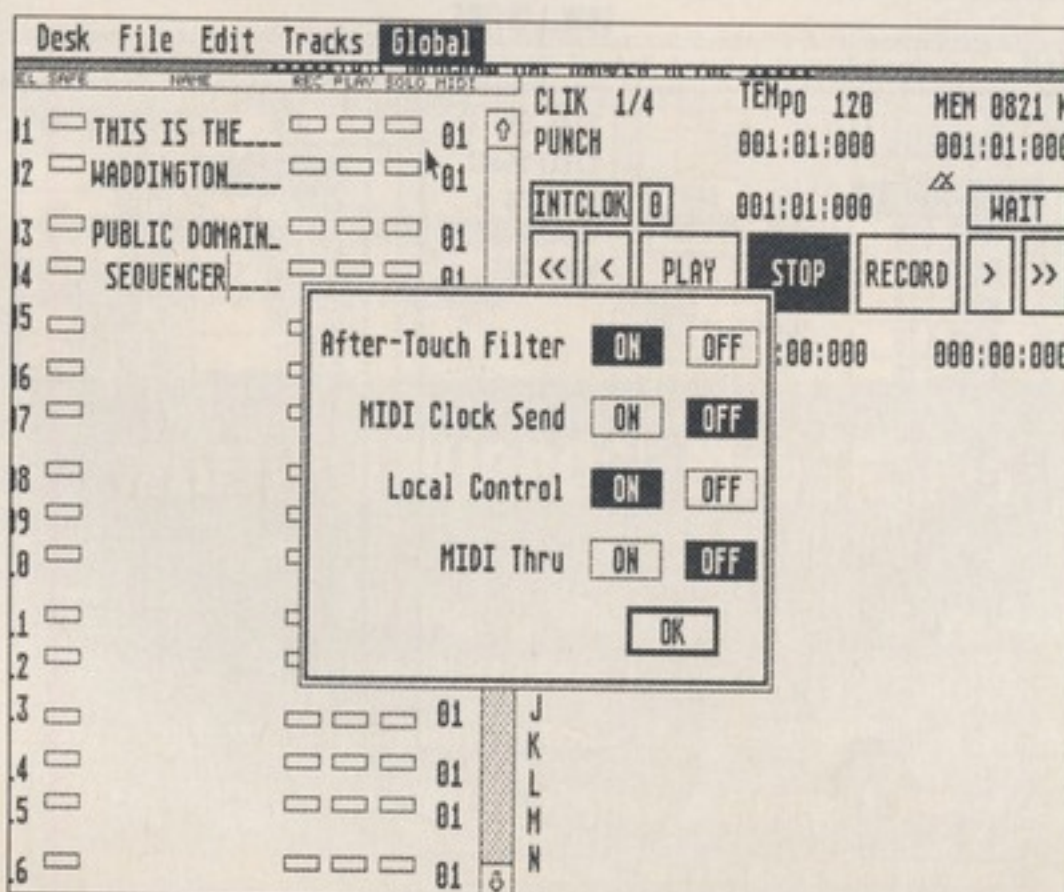


The busy looking work screen from the Tiger Cub.

- + Good editing that is easy to see and cope with
- + Good arrange feature
- + Supports Midi File
- + Cue list
- + Runs on ST520 and A500
- Does require data entered from the keyboard at times.

Bars and Pipes 1.0f
For All Amigas with 1Mb memory
From Precision Software or Newtronic
Tel: 081 330 7166/081 659 0744
Price £219.95

Highly original program that has very good graphic approach to sequencing, routing the data literally through on-screen water pipes. Music Tools are devices that you can insert in the data 'stream' and these have many functions, some of which generate new music lines from your input, provide echo facilities, harmonise etc. There are additional disks of tools that you can buy



The public domain Waddington Sequencer doing its stuff.

which include using the internal voices. Professional and Junior versions are planned.

PROS AND CONS

- + Simple to use
- + Lots of very musical features
- + Add-ons available
- + Can handle lyrics and print outs
- + Can cope with 80 MIDI channels
- Not cheap
- Note editing not too hot
- Definitely needs colour monitor

Cosh Sequencer
For All ST's
From All good PD Libraries
Price £2 - £4 approx.

Really quite amazing value for money, as the *Cosh Sequencer* is a superb piece of software that has advanced features such as tempo change coupled with good graphic editing, track listing, punch in and out, track copying, and quantizing. You wonder where the strange name came from? Well violence is not involved as it was named after its programmer, Henry Cosh.

PROS AND CONS

- + Price
- + Well thought-out program
- + Full manual on disk
- + Many features
- Some slight idiosyncrasies in operation.

Quartet
For Amigas/ST
From Microdeal
Tel: 0726 68020
Price £24.95

Interesting sequencer that uses internal voices but can also output MIDI in each track. Makes a handy place to start. It will also work with IFF samples (Amiga Version). - Amiga version is an improvement on SY version.

PROS AND CONS

- + Cheap
- + Supports MIDI and internal sounds
- + Very visual
- Editing features not too good
- A bit basic as sequencers go.

Musician
For All Amigas
From Thalamus
Tel: 0734 81726
Price £29.99

Very powerful program that can squeeze that last drop of sound from the internal chip as well as editing samples. Excellent graphics help you to do this as well as some rather slick routines. Sequencing is with strings of data, again with smart routines to help you.

PROS AND CONS

- + Price
- + Very powerful
- + Ideal for games soundtracks
- + Superb sound creation
- Not very good if you are a beginner
- Only accepts MIDI inwards.

Trackman II
For All ST's
From First Rate Ltd
Tel: 0481 23169
Price £199

Synthesier Voicing and Library Software

One of the great boons of MIDI, especially with the complex multi-timbral synths/tone modules that are on the market, is that you can see the set-up on screen instead of labouring over LCDs.

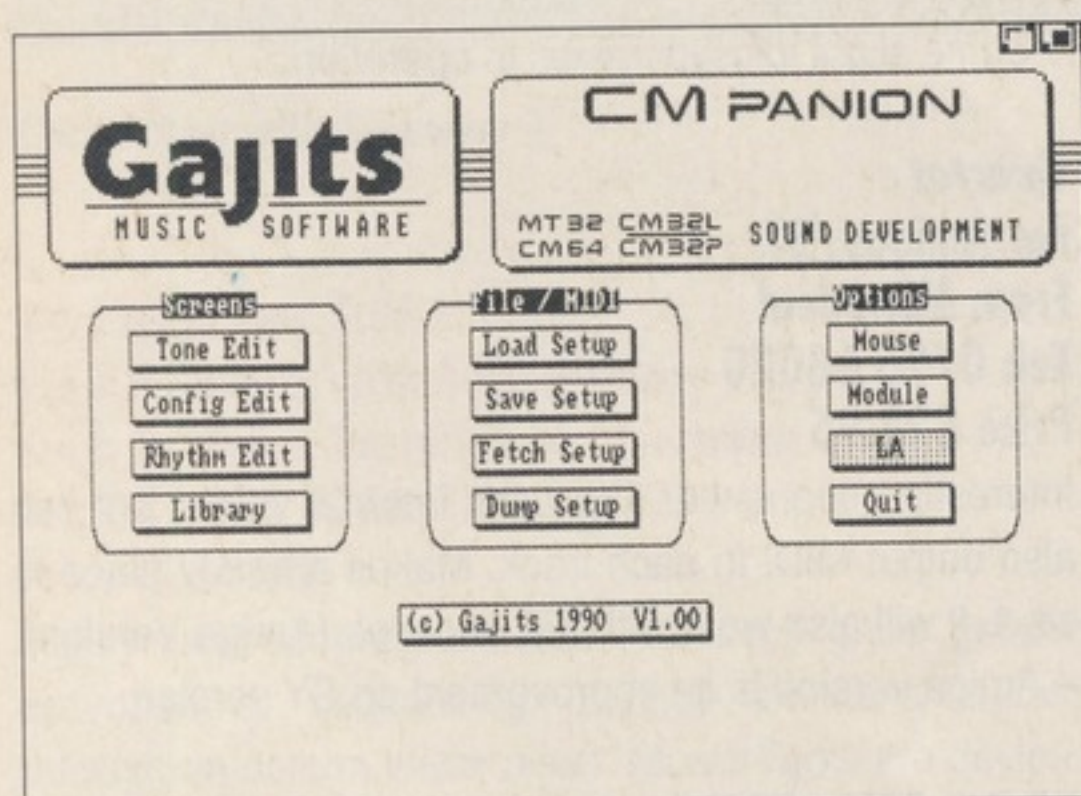
Many programs have automatic voice generation to help with creating new sounds. There are rather a lot of voicing programs about and to list them all, let alone attempt to make a buying choice, would be a daunting and essentially pointless task. The next section therefore will point you in the right direction.

The buzzword to watch for is 'universal editor'; a voice editor that can be configured for any synth – provided you know your way around the system's exclusive MIDI codes or can buy a workable template which suits your needs.

Trackman II is very much a musician-led program; that is to say, it is simple and instinctive to use but it has many advanced features should you choose to call them in. Auto mixdown, full MIDI control and drum maps among other facets, plus interaction with Midiman, the universal editor.

PROS AND CONS

+ Lots of facilities



Options for voicing Roland synths and modules courtesy of the Companion

- + Very easy to understand and use
- + Loads Midi Files
- + Good and simple editing
- Initial price.

Trax
For Macintosh /PC/Amiga/ST
From Passport
Tel: 081 963 0663
Price £99

Nice entry-level sequencer with Macintosh type display using multiple windows. Easy to use and understand with song edit function.

PROS AND CONS

- + Price
- + Easy to use
- + Multiple window
- Editing not very quick
- Can't expand beyond 16 MIDI channels.

Prodigy
For Atari ST 1040
From The Digital Muse/Audio Software
Tel: 071 586 3445
Price £129

32 track cut-down version of Virtuoso which has some very fast features including 'piano roll' style editing and advanced quantize. It takes a little bit of getting used to but the promised add-ons, like scoring packages and

GEM compatibility, go some way to making up for this, and reward the time spent.

PROS AND CONS

- + Very fast – thanks to re-writing of screen management
- + Accurate
- + Can perform disk operations whilst still running
- + Can upgrade to Virtuoso
- Editing could be smarter.

Beyond V2
For Macintosh
From Dr T
Tel: 081 963 0663
Price £259

99 track sequencer with high resolution accuracy and some interesting harmonization and 'humanization' routines plus good editing.

PROS AND CONS

- + Many professional features
- + Graphic editing and display
- + Can be expanded to run 512(!) MIDI channels
- + Auto mixdown
- + Easy to use
- No notation or data editing
- Not cheap.

Harmoni
For All Amigas
From The Disk Company
Tel: 010 331 4910 9995
Price £49.99

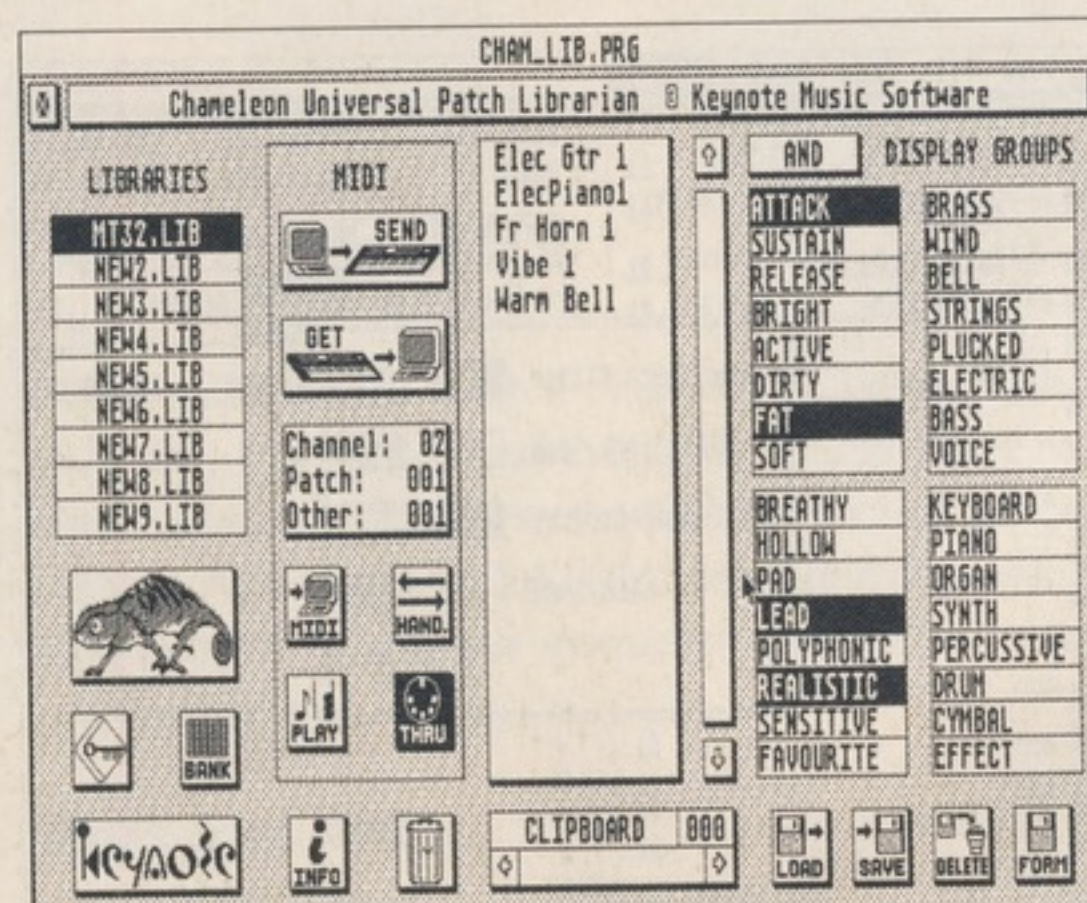
Well-priced Amiga sequencer that has quite a few up-market features. Included for your musical pleasure are looping, filtering, arpeggiation and pattern reversal, SMPTE time display, pattern sequencing.

PROS AND CONS

- + Price
- + Features
- Editing and quantization a bit basic
- Doesn't support internal voices
- Pattern sequencing limited.

Vision/EZ Vision
For Macintosh
From Opcode
Tel: 081 963 0663
Price £399/£115

Professional-level sequencer with many superb features. High degree of accuracy and multiple window display using graphic curves to draw in control functions. See *Studio Vision* in the Direct to Disk section for news of an update. There is also a junior version called *EZ Vision*.

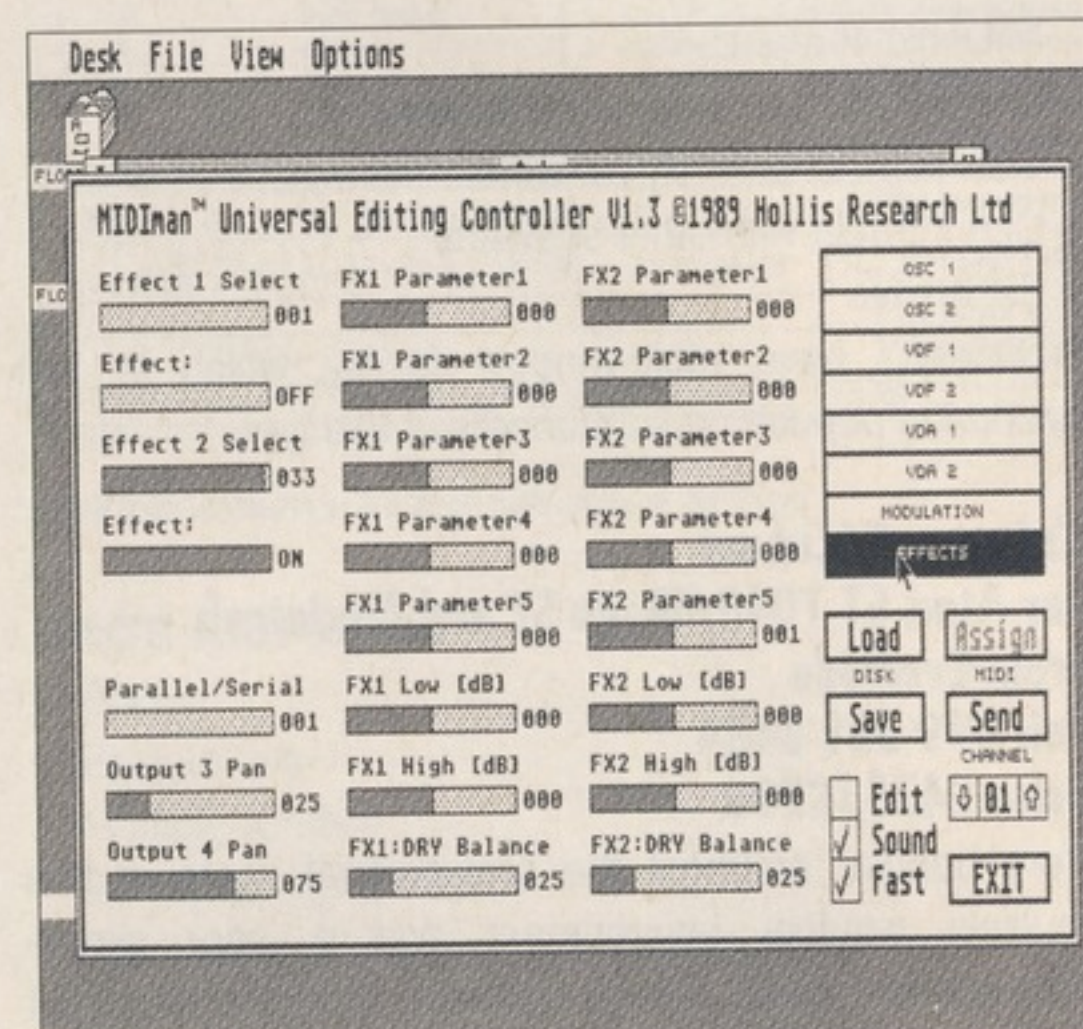


The Chameleon universal librarian accessing voices by responding to attributes

PROS AND CONS

- + Very professional package
- + Help screens
- + One of the first that can upgrade to digital recording
- Rather expensive
- Only takes 32 MIDI channels
- Requires 2Mb memory.

Track 24
For Atari ST series and Amiga
From Comus/Soundbits
Tel: 021 733 2063
Price £75



MidiMan's universal librarian and voice editor

Well-priced budget sequencer with features rivalling software twice its price. 24 tracks for you to play with and record on. It is able to record chords on one of those tracks in step-time by typing in the name and type of chord. Manipulation of marked blocks of music is not too good but you can do a real-time mixdown which can include tempo changes. Editing uses traditional music notation. Compatible with more up-market sequencers/arrangers and scoring packages; Studio 24, Big Band and ProScore which are also from the same company.

PROS AND CONS

- + Cheap
- + Good sequencing facilities including Mixdown
- + MIDI file capabilities
- Editing is peculiar
- A bit slow in working
- Does not support internal voices.

Steinberg Pro 24 v3
For Atari ST1040
From Evenlode
Tel: 099 389 8484
Price £95 approx.

This piece of software goes to show just how fast the pace of change can be in the world of computer music. *Steinberg Pro 24* was accepted in many areas of the music world as the industry standard sequencing software for many years. It is now available at some stupidly low prices. Although outdone by other packages in features it is nevertheless very intuitive to use and offers an excellent introduction for the beginner in computer music.

PROS AND CONS

- + Easy to use
- + Established program
- + Easy editing
- Arranging section not too easy to work with.

KCS Level 2

For Atari ST, Amiga, PC, Macintosh
From Dr T
Tel: 081 963 0663
Price £225

Runs on 48 tracks, has loads of features and is the most popular sequencer from Dr T's wide range. Works well as a base unit and can be expanded along with your skills and requirements. Add-on programs to enhance editing features and also music printing are readily available.

PROS AND CONS

- + Well-established program
- + Upgrades and works with other software
- + MIDI file
- Editing not easy

SAMPLERS

The Public Domain market is full of samples of all sorts, from Kylie and Jason through the Classics to Thunderbirds.

However, to actually digitise sound you will need hardware and this is where the expense comes in. The main points to remember are that editing needs to be clear and easy, sounds should be able to be filed away to be re-used in other utilities, and MIDI support is a must for the serious user.

Tiger Cub
For Atari ST/STE, Amiga
From Dr T
Tel: 081 963 0663
Price £99

Low cost 12 track sequencer that provides a good introduction to sequencing. Has really advanced graphic editing with the ability to draw in tempo changes, pitch bend, modulation, volume and velocity curves. It comes with a simple scoring package. The Amiga version supports the internal voices, as does the STE version.

PROS AND CONS

- + Easy to use
- + Low Cost
- + Superb graphic editing for its price
- + Well documented and presented on-screen
- One or two peculiarities in the way it works
- Will take up a large chunk of memory, especially with Amiga samples and scoring facility.

Waddington Sequencer
For All Atari ST's
From Public Domain
Price about £2-£4

Although limited in facilities like quantize and editing, it does provide a basic grounding in the function and possibilities of sequencing software. Another obvious point in its favour is the price, or rather lack of it. If you only want to test the waters of computer music then this is definitely worth having a look at.

PROS AND CONS

- + Costs next to nothing
- + Excellent introduction to MIDI sequencing
- + Easy to use
- Limited facilities
- Can crash on occasions.

EZ Track Plus
For Atari ST

From Syndromic Music
Tel: 081 444 9126
Price £49.95

Again the price is low but this time there is not much to recommend the software or to deride it. Basically it's a reasonable sequencer which is fairly easy to use. Compatible with other Hybrid Arts programs that also boast a multi program environment. Limited on quantizing but not bad for the money.

It is also a program which was built with the computer user rather than the musician in mind; editing is in data only. As long as you're not expecting to score Francis Ford Coppola's latest film or write a concerto you could be alright as one point *EZ Track Plus* does have is that it is good for organising songs.

PROS AND CONS

- + Good price
- + Easy to use
- + Compatible with Hybrid Arts *EZ Score*
- Limited on editing and quantizing.

Studio 4 Mk 1
For Archimedes
From EMR
Tel: 0702 335747
Price £99

We have already mentioned that the Archimedes is an excellent machine in terms of its musical potential. The major downside is the cost and availability of software. Studio 24 shows well on the price front, being the cheapest sensible sequencer for the machine. However, it does cut a few corners here and there, but it is not a bad sequencer, with average editing facilities.

PROS AND CONS

- + Best for the Archimedes in this price range
- + Can be upgraded to more powerful Mk2
- + Very fast
- Poor documentation
- Editing of data non-graphic.

CZ Android
For Atari ST
From Syndromic Music
Tel: 081 444 9126
Price £75 but often cheaper.

If you have a Casio CZ synthesiser - a four year old range of machines which were all the rage at the time and which can now be picked up for around £50 - then get Android. On their own CZs are pigs to program and the preset sounds are, to put it mildly, rancid. Use this, and your CZ will never sound the same. Not a new program but tried, tested and found to be workable.

PROS AND CONS

- + Easy to use
- + Excellent graphics
- + Good library facilities.

Companion/4D Companion
For Atari ST and Amiga

MULTIPLE PURPOSE PROGRAMS

The 'all talking, all singing, and all dancing' section. These are programs that cross over from having just one dedicated function. In the case of much vaunted *Music-X* you have a complete music studio in one rather elegant casing. The other programs which we have included here are mainly for fun, although some serious work can be done with them.

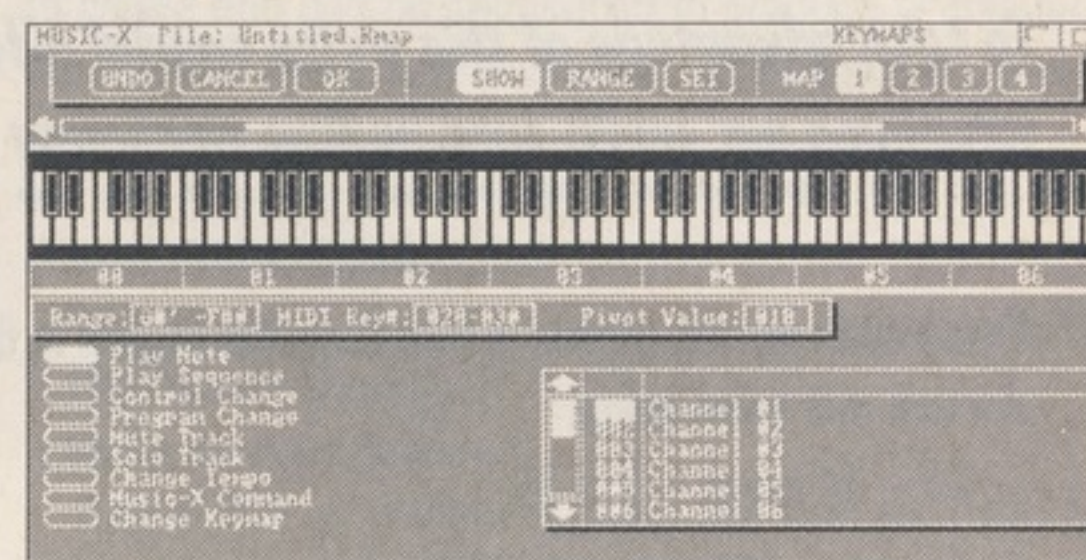
From Gajits:
Tel: 061 236 2515
Price £99

A smart piece of software that not only covers the Roland D110/MT32/CM32/CM64/ modules but also the D10 and D20 keyboard versions.

PROS AND CONS

- + Voice creating feature
- + Easy to use
- + Configures a very difficult instrument
- + Amiga version will multi-task
- Roland's versions of the D110 may not work with it (or any other software!)

Dr T Caged Artist Series



Music-X splits keyboard sounds into zones

For Atari ST, Amiga, Macintosh
From Dr T
Tel: 081 963 0663
Price: (approx) £120

Solid series of voice editors for a whole pile of synthesizers/tones modules/effects units. Their principle features are graphic editing, extensive library features, random voice creation, multiple bank storage and editing and voice merging.

PROS AND CONS

- + Well established
- + Good features
- + Can run with other Dr T and certain other software
- + Pricey in some cases.

Steinberg Synthworks series
For Atari ST 1040/Mega ST
From Evenlode
Tel: 099 389 8484
Price from £100

Another well-respected set of synth editors with all the features that one would expect, such as random voice creation. These can be resident with Cubase and if you have enough memory they can be called in via the Satellite linking program.

PROS AND CONS

- + Well established
- + Good features
- + Prices can sometimes be very favourable
- Some of them unhappy with non-Steinberg programs.

C-Lab Polyframe
For Atari ST 1040/Mega ST
From C-Lab (Sound Technology)
Tel: 0462 480000
Price £TBA

The concept is of a universal program which allows simultaneous editing and management of sounds from any synthesizer using multiple windows which are also active simultaneously.

The finished music, or noise, can be routed from an overview window. It can also be separated or run together with Creator/Notator or any program that will run with SoftLink. As yet we've not tested it so will skip

SAVE OVER £6

off the news-stand price when you take out a subscription to
New Computer Express today

54 issues for only £31.35

or to put it another way . . .

get your copy of NCE delivered to your
door for the old price of just 58p a copy!

To take advantage of this extra special offer, complete the coupon below and return it immediately or, better still . . .
telephone our credit card hotline right now on 0458 74011 to book your guaranteed copy every week.

Please enter my subscription to New Computer Express at the special
discount rate ticked below.

- ☐ UK - 54 issues - £31.35
☐ Europe - 54 issues - £63.75
☐ Rest of World - 54 issues - £89.15

N.B. All overseas subs are sent by Airmail for speed and safety.

Please make cheques/PO payable to Future Publishing Ltd and send with this
coupon to:

NEW COMPUTER EXPRESS, FREEPOST, SOMERTON, TA11 7BR.

Name: _____

Address: _____

Postcode: _____ Tel: _____

I wish to pay by (please tick as appropriate)

☐ Access ☐ Visa ☐ Cheque ☐ PO

Card No: _____

Expiry date: _____ NCE/SP/1090/K

PC MUSIC SOFTWARE



We Supply:

Music Printing & DTP
Midi Interfaces
Programming Tools
Sound Modules/Cards
Sequencer/Editing S/w
Technical Books
Sample Cards



Voyetra: Sequencer Plus V4.0

Professional Music Software for SoundBlaster, AD Lib, Roland
and IBM SoundCards and PC Midi Interfaces

For any IBM Compatible Computer
Compatible with ALL Midi keyboards
Full Upgrade path for software
Free sign up to The Music Network (bulletin bd)
Compatible files for Music Printing / DTP
As used in professional Recording Studios
Options for 64 MIDI channels and SMPTE sync
Special prices for software with MIDI interface

Full Support For

SOUND CARDS	MIDI INTERFACES
Roland LAPC-1	MPU-401/IPC/IMA
SoundBlaster	V4000/4001
AdLib Card	V22/24/sm
IBM Music Feature	MQX-16/32

Sequencer/MIDI Software

Voyetra Sequencer Plus Jr. V4	£ 55.00
Voyetra Sequencer Plus V4	£165.00
Voyetra Sequencer Plus GOLD V4	£295.00
Ballade V2 (Now Prints!!!)	POA
MidiQuest Universal Editor/Librarian	£175.00

Music Printing Software

Basic Composer	£ 49.95
Dr T Copyist I (Prints Seq Plus files)	£ 79.95
Songwright 4. (MIDI)	£ 87.00
Laser Music Processor (MIDI)	£149.95
Score (Professional Typesetting)	£649.00
Finale (MS Windows required)	£599.00

MIDI Interfaces

Voyetra V22. (2 in 2 out)	£119.00
Voyetra V24s (with SMPTE sync)	£289.00
Voyetra V4000 (mpu)	£139.00
Roland MPU-IPC (mpu)	£139.00
Roland MPU-IMC (Micro-channel)	£210.00

PC Sound Cards & Modules

Ad Lib Card	£149.95
SoundBlaster Card	POA
Roland LAPC-1 Card	POA
PC Replay Sampling Card	£149.95
Roland CM Modules	POA
Yamaha TG Modules	POA

Computer

MUSIC Systems Ltd
5/7 Buck St, Camden
London, NW1 8NJ

Tel: 071 482 5224

Fax: 071 485 9302

Access : Visa : Mail Order

Goods will be sent by First Class
Post, recorded delivery unless
otherwise stated. Please allow time
for cheques to clear. In stock items
for credit card orders delivered next
day. Demonstrations by
appointment.

Specialists in Music Software

the plus and minus awards but it looks good so far and is planned to work and recognise automatically a wide range of synths.

SYNTH LIBRARIES (VARIOUS)

For Amiga, ST
From Public Domain
Price £2.95 approx.

It is worth noting that there are various Public Domain programs that will voice the most popular synths; e.g. DX7, CZ series. As a cheap and cheerful introduction they could well be your best bet.

PROS AND CONS

- + Cheap
- + Usually have a set of new voices for your synth
- + Sometimes have random voice generation
- Sometimes crash for no apparent reason

INTERNAL VOICE PROGRAMS

No matter how good your ideas are, the quality of sound which you are able to produce depends on the computer at your disposal. Only the Archimedes and the Amiga are serious contenders for real sound synthesis at present, although Atari has tried to enter into the spirit with the STE.

There is already one computer, the FM Towns (a 386PC with a CD-ROM drive which is not yet released in Europe) which has several bespoke synth chips on board.

Future computers will doubtless go even further down this road in order to produce the modern micro Holy Grail of true multimedia with music being just one aspect of a standard. PC owners need not feel too left out as they can buy slot-in synthesizer cards from Roland. Expect extensive growth in this field soon.

- Editing not always available
- Editing is usually numeric and not easy to understand

Chameleon
For Atari ST 1040
From Keynote
Tel: 0761 32610
Price £89.95

A very neat universal editor that can file sounds under their attributes and it runs as a desk accessory. As yet it is only a librarian and not a voice editor but this is under development.

PROS AND CONS

- + Cheap
- + Stores voices as Midi File to load into any sequencer
- + Works with virtually any synth
- Needs min 1mb memory and probably more
- Templates require computer programming knowledge
- Not totally interactive.

Midiman
For All ST's
From: First Rate Ltd
Tel: 0481 23169
Price £79.00

The partner and desk top accessory of Trackman. They will interact when working together but Midiman, like all the universal software mentioned above, will hang around as a desk accessory and work with any

sequencer. A very positive aspect is that Midiman actually programs the sounds of the synths and can set up multiple patches.

PROS AND CONS

- + Comparatively cheap
- + Runs with any sequencer as desk accessory
- + Many synth templates available
- + Stores all voices
- Cannot store banks of voices
- Template creation needs programming knowledge.

X-OR

For Atari ST, PC, Amiga, Macintosh
From Dr T
Tel: 081 963 0663
Price £175

Uses multiple window environment. Each screen will contain different types of data. Combines powerful library and editing features and can also blend sounds together to form new ones. Will also store data relevant to tuning tables and drum kit settings as well as sounds.

PROS AND CONS

- + Well documented
- + Help line service
- + Full database facilities
- Memory intensive
- Difficult to make your own templates.

DIRECT TO DISK RECORDING

Why bother mucking around with boring old analogue cassette tape, and by doing so losing sound quality when you come to put your master work into playable (and hearable form)? Direct to disk recording is the way ahead in computer music.

The concept is simple albeit expensive; all you need is a high-quality bolt-on sampler and, because the sound is captured at a very high rate (about the same as a CD player), you will also need a computer with massive amounts of memory storage; in other words a hard drive or even CD-ROM. The reason for this is that even recording in mono generally takes some 5Mbs of memory storage, stereo will double this.

You then have the opportunity to edit with greater precision than has previously been possible, using suitable software. You can move elements about, remove sections, cross fade, in fact manipulate the captured sounds in any conceivable manner, all in stereo and ideally using four tracks.

But all this costs money – and lots of it. If you have the loot, it makes for a superb mastering function – not to mention the ability to synch up with video for post production over-dubbing.

All good things come to those who wait though, and it will only be a matter of time before many sequencers, albeit running on micros as yet unreleased, will have this as a standard feature, running alongside MIDI data. We decided to forego the pros and cons here as the systems are fairly equal with the only minus point being the cost.

Genedit

For Atari ST1040/ Macintosh
From Syndromic Music
Tel: 081 444 9126
Price £250/£350

Has a prodigious number of templates which enable it to cover many instruments and effects units; it is easy to create your own and pretty easy to get used to. Will create new sounds easily and all library data can be printed out.

PROS AND CONS

- + Well established
- + Easy to use
- + Good graphics
- Expensive
- No parameter copy functions
- Will only run one editor at a time.

Audio Engineer Plus
For Amiga (requires 1 Mb RAM)
From HB Marketing
Tel: 0753 686000
Price £199

Probably the best sampler about for the Amiga, with superb sound quality and excellent graphics enabling spot-on sample editing to be performed. Loops are easy to create and can be sequenced to produce simple format songs thanks to a 'Multiple Loop Sequencer'. From the same stable as the Audiomaster series.

PROS AND CONS

- + Easy to use
- + High quality sound
- + Many excellent features
- + Saves files in several formats that can be used in other software.
- Expensive.

AMAS

For Amiga
From Microdeal
Tel: 0726 68020
Price £75

Quality sampling and editing plus a MIDI interface which makes it rather a good bargain.

PROS AND CONS

- + Clean samples
- + Comes with MIDI interface
- + Well organised program
- None, unless you think it is too expensive.

Technosound

For Amiga
From Centresoft
Tel: 21 625 3399
Price £34.99

Cheap n' cheerful sampling package that has all the basics including some reasonable editing features and some built-in real-time effects. It falls down slightly in that it only has a smallish sound storage buffer. Good quality for the money though.

PROS AND CONS

- + Price
- + Helpful cassette guidance
- + Easy to use

HYBRID ARTS AN EXPLANATION

Hybrid Arts has no UK distribution at the moment. But here's how to get in touch with the company's European distributors:

Hybrid Technology Computer Systems
Deutschland
GM BH
Eschborner Landstrasse
99-101
6000
Frankfurt Main
90 FRG
Tel: 010-4969 789 2054 or 2057
Michael Von Garnier

THE MUSICAL MICRO...

Home computers are not all equal when it comes to making music. Jon Bates takes an overview of the options...

The Atari ST is still the only computer to have MIDI ports built in. Other machines require a hardware interface that uses one of the expansion ports and has the 5 pin DIN MIDI plugs on it. And herein lies a slight problem, because several interfaces are only compatible with the software from the software house that developed the interface... Early BBC, Commodore and Spectrum music software, like some PC programs is also constrained by this compatibility problem. The PC market does have an 'industry standard' interface called an MPU401 although some care is still needed to avoid falling victim to the dreaded incompatibility problem.

Fortunately the Amiga does not seem to have the same drawbacks; all interfaces so far tested seem to be happy with any software thrown at them. Similarly, the standard Acorn MIDI interface for the Archimedes appears to present few problems. There is music software and hardware available for the Macintosh in copious amounts, most of it American and of high quality, but expect a high price - while the Mac is now much more affordable, software prices have yet to follow hardware prices.

Whichever machine you own - or plan to buy for making music - the choice of interface should really be dictated by the range of software that is available for it. Check out software options before you invest in hardware must be the golden rule!

And if you're setting up a system to a tight budget, bear in mind that bargains can occasionally be had in the 8-bit world - it's sometimes possible to pick up a complete package by scouring the second-hand columns. Start with Shopping Express.

So what exactly are the relative merits of the common home machines when it comes to making music? Here are the options...

SPECTRUM

When it comes to making music the 48K Spectrum is not exactly Mr. Wonderful. Left to its own devices, it generates one channel of sound with only one sound - bleep. Not a lot of good for serious sound creation, but a range of add-ons are available, many of them second hand.

Other minus points include the slowish 8 bit, Z80-based architecture, no built-in MIDI, and a small amount of usable memory. The 128K

Spectrum does offer one way MIDI but it is very badly implemented, using a non-standard port which also acts as the printer port. There is a better sound chip in the 128 but that only brings it up to the same standard as the BBC, ST and so on.

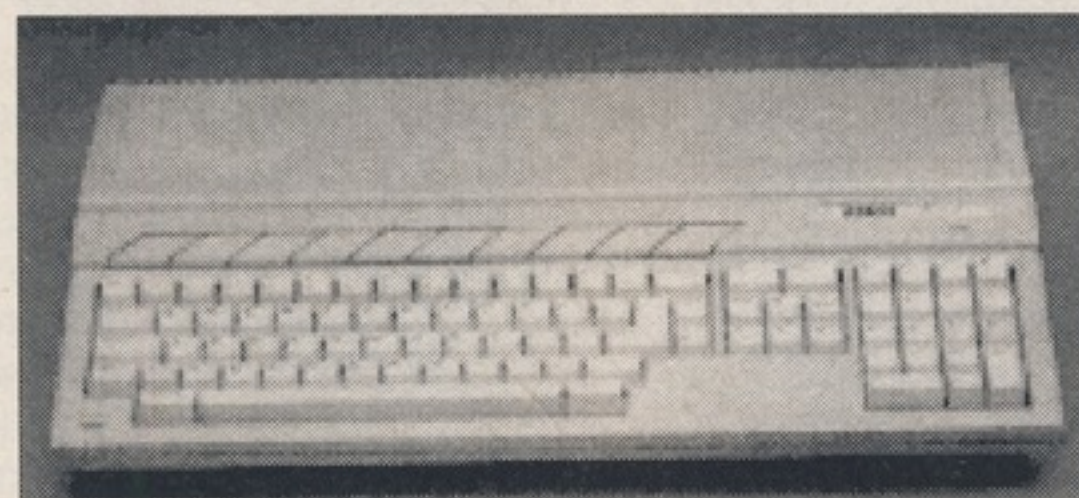
Most of the Spectrum music programs are cassette-based which makes for rather slow working in these dik-oriented day, and there's always the risk of an occasional hiccup in loading. However, despite all these drawbacks, a few years back the music market for the Spectrum was a thriving business - probably for no greater reason than there were absolutely thousands of Speccies on the market.

PROS AND CONS

- + Cheap
- + Possible to get a complete system second-hand
- Interface compatibility problems
- Most software cassette-based
- Hardly the white-heat of music technology

ATARI ST/STE

As a stand-alone music machine the ST is not particularly brilliant. Although there are programs that use the ST's internal chip to create sounds, in the main they are of fun value only and can be found in



the Public Domain. The STE, on the other hand, has a much better sound chip, but not much software that supports it directly.

Like many other computers, the ST is able to convert stored sound samples back to sound, and there are a number of samplers available for it. However, it is the only mainstream computer to have MIDI interfaces on board. The advantages of this are that it involves less expense for the purchaser and that there can be no incompatibility worries - all ST MIDI software is bound to run.

PROS AND CONS

- + Built-in MIDI ports
- + No compatibility problems
- + Large software base
- + Not horrendously expensive

- Some programs require hi-res screen and 1040 minimum memory.
- GEM environment can be slow
- Needs lots of memory for serious use

AMIGA

Although it has no built-in MIDI interface there are no compatibility problems with the Amiga - all interfaces work happily with any MIDI software. The internal stereo sound chip is very good at both creating and playing back samples and the Amiga's multi-tasking capabilities can be used to



good advantage, allowing you to have several music applications running together.

Initially, the software base was slow to pick up but has now reached quite a decent size with many programs being crossed over from other platforms. The best programs are generally those created specifically for the Amiga. Since it is so capable, many programs use MIDI and internal voices, which allows for a nice cheap way of incorporating samples of your own making within a piece that uses external synths.

The A500 will need some serious expansion though if you want a large number of programs running simultaneously, so you might want to go shopping a little higher up the range if you're really serious about music.

PROS AND CONS

- + No MIDI compatibility problems
- + Excellent internal sound chip
- + Stereo output
- + Multi tasking
- MIDI interface not included
- Will almost certainly need 1Mb minimum memory
- One of the more expensive options

PC

Until recently, at least, the PC has generally been perceived as a business machine rather than as a home entertainment centre. Since music comes under the entertainment label, whether it be for the user or listener, it is not yet one of the PC's strong points in the UK, although there's a lot happening

onare front in America.

The American market has always been quite buoyant with music software. The 'industry standard' interface is the Roland MPU401 and its upgrade or clones. This is a very well-equipped interface that not only accepts and works with MIDI, but can also convert pre-MIDI time-clocking systems, known as CV (Control Voltage), by operating on a certain number of clicks per beat. However, it is not cheap - the original interface costs over £250. On the up-side, there are various decent interfaces available for under £100 (make sure the interface is a MPU401 clone though).

PROS AND CONS

- + Rapidly growing software base
- + PCs are very versatile and easy to get hold of.
- MIDI compatibility problems
- Poor internal sound chip
- Interfaces comparatively expensive

BBC

The BBC is not terribly versatile since it has a fairly basic sound chip, but the main disadvantage is its lack of memory - even the souped up versions left little memory for large pieces.

There used to be a program called the UMI 2B resident inside the BBC on a ROM chip, which was very advanced for its time (1985). This was a 16 track MIDI sequencer with the ability to link sections of tracks together to form whole songs. Since it was inside the machine it left the memory free for storing the song data, although later versions also came with memory expansion boards.

The BBC had not an inconsiderable number of MIDI programs designed for it, some of which can still be found - including sequencers, voicing programs and some education software.

There is another solution for the BBC: turn the whole computer into a synthesizer. Hybrid Technology did just that with the Acorn 200 and 2000. The hardware box and keyboard turn the BBC into an eight voice synthesizer in stereo. It has had many devotees, although I wouldn't count myself among them, as it leans too much towards programming rather than music writing. Since so many UK educational establishments have BBCs software is likely to be about for some time.

PROS AND CONS

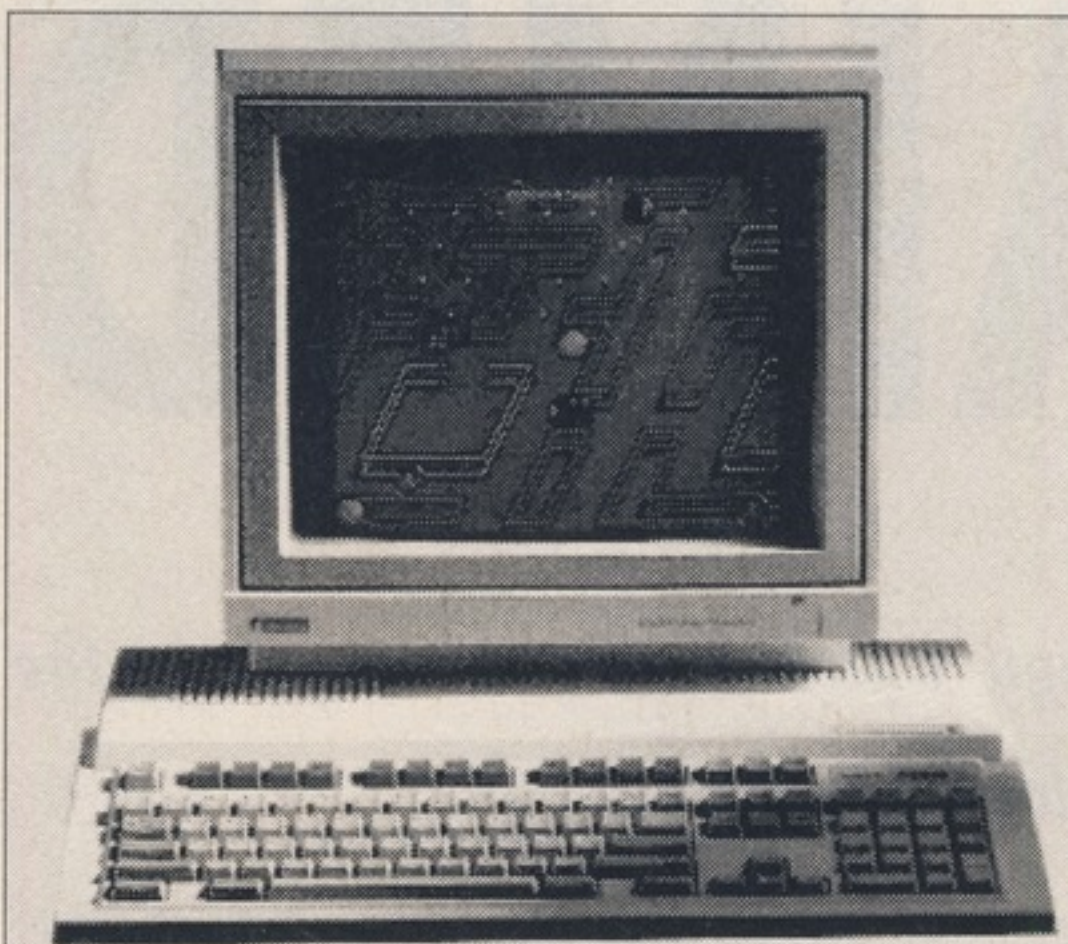
- + Very popular micro
- + Used in many schools
- + Software available although second-hand
- Small memory
- Limited in what it can do

- Interfaces often incompatible

ARCHIMEDES

Acorn's successor to the BBC is a very fast machine which is capable of some staggering musical feats.

The internal chip can cope with eight channels of sound and provides stereo output. Any of



the eight channels can be placed in the stereo picture, which means you can pan them from left to right, thus creating a true stereo result as opposed to simulating stereo with left and right channels. The chip is ideally suited to processing sampled sound and most software takes advantage of this. And of course the Archimedes' speed makes it very good at handling large amounts of information - it copes with large musical applications with ease. Bear in mind, though, that early versions did not have a MIDI 'Podule'.

PROS AND CONS

- + Excellent internal sound chip
- + Very fast processor
- + Multi-tasking
- + New models have built-in MIDI interface
- Small software base

MSX

For music, you have to link MSX with Yamaha, who stepped out boldly with the CX5 series of computers that had a built-in sound module based on Yamaha's own world-beating FM synthesis chips. The CX5, now sadly out of production for some years, can with MIDI fitted as standard as well as true stereo output and was accompanied by a plug-in keyboard. Without any additional software the CX5 had a friendly music program resident that you could call up any time.

Yamaha's software has always been ambitious. The company pioneered the first synthesizer

voice programmers - not surprisingly, for use in its own synths - and also developed a real-time MIDI sequencer that was reasonable if somewhat sticky on editing and quantisation. It also produced one of the best step-time sequencers. A whole suite of educational software followed; chord finders for guitars and keyboards, advanced single keyboard simulators, voicing software for the internal chip and even more for the MkII version, the CX5 with 128K memory. Some UK software was developed, but like the hardware, you will now only find it in the second-hand columns. It's well worth looking out for, though. The CX5 can be had for a song (Groan - Ed), and is an excellent music machine.

PROS AND CONS

- + Excellent software on plug-in cartridges
- + Good FM synth module on-board
- Early versions didn't have disk drive
- No software currently in development
- Z80-based and consequently rather slow

MACINTOSH

Most professional studios and composers who use MIDI or music DTP are running a Mac. Its speed and the range of machines make it the idea tool to work with. Since the Mac is still an upmarket machine, the software is targetted accordingly - meaning that it tends to be expensive but very comprehensive. However there are now some indications that prices are coming down, as the Mac reaches into the home market.

Sequencers are plentiful, and many of them have software modules that convert the data into high quality music notation as used by music typesetters. If you were going to set up on a serious footing in the music business, the Mac is really the machine to have.

The programs available range from just plain MIDI sequencing and voice programming to direct-to-hard disk recording and film scoring programs with tools that will not only synchronize the cues with the video timecode but will squeeze music cues to make them fit the time available. Seriously heavyweight stuff, and much of it American as you might imagine.

PROS AND CONS

- + Excellent hardware - and the range of machines offers a clear upgrade path
- + Fast processors available
- + Multi-tasking
- + A professional tool
- Still rather expensive
- Not yet a common home machine in the UK

HOW THE COMPUTERS COMPARE

	ST	AMIGA	CPC	SPECTRUM	64	PC	BBC	MAC	ARCHIE	MSX
COST OF INTERFACE	£0	£40+	£50+	*£30+	*£30+	£100+	£25	£99+	£79+	£0
COMPATIBILITY	Y	Y	N	N	N	N	N	Y	Y	Y
LOWEST COMMERCIAL SOFTWARE PRICE	£50	£50	£35	£10	£15	£80	£N/A	£150	£100	£N/A
AVAILABILITY	good	very good	little new	none	good	little new	fair	good	good	none

* No longer produced commercially

JARGON EXPLAINED

Having trouble understanding the lingo which bars your way into the world of computer music? Well, it's explained here.

AFM: Advanced FM

AFTERTOUCH: The pressure applied to a note on the keyboard after it is initially struck. This can affect the tone in many ways, depending on how the sound is programmed and what pressure is put on the key.

AWM: Advanced Wave Memory – Yamaha's own method of sampling and storing sound.

CHANNEL: One of the 16 MIDI transmitting and receiving channels.

COPY: To duplicate a set of events somewhere else in a piece.

EVENT: Any single thing that is recorded via MIDI.

FM: Frequency Modulation – a technique of sound synthesis that combines and modulates simple wave forms to produce far more complex ones. First brought to the fore by Yamaha.

LA: Linear Arithmetic synthesis – using small sound samples combined in such a way that they modulate to form complex and new sounds. Roland pioneered this.

LAYERING: Combining two sounds on top of one another – for example piano and strings. You play a note and hear both instruments.

LOOP: To repeat a piece or part of a piece between specified markers – can also refer to repeating a marked section of a sound stored in a sampler.

MIDI: Musical Instrument Digital Interface – a standard 'language' by which digital instruments, sequencers and computers can communicate. It works on 16 channels simultaneously and translates any action taken on an instrument into a common code.
For a fuller explanation see pages 23 and 24.

MODULATION: Usually said to mean adding another frequency to a sound – it often has the effect of modifying in some way

MULTI-TIMBRAL: Capable of producing more than one sound simultaneously.

PATCH: Can apply to two things. 1) A particular voice on a synthesiser – a 'string patch'. 2) Used on multi-timbral synthesisers to mean a particular pattern of voices

pre-set to different MIDI channels and memorised in total as a patch.

The term comes from the time when synthesisers consisted of separate modules that needed to be 'patched' together in certain configurations.

PCM: Pulse Code Modulation. Another method of storing sounds digitally, more often used internally in instruments as a way of storing waveforms.

PITCH BEND: Usually either a wheel or joystick control on an instrument that will raise or lower a note in pitch. The amount of pitch shift is governed by the degree of movement of the control and the way in which the voice is programmed to respond to it.

POLYPHONIC: Literally, 'many notes'. If a tone module is said to be 32-note polyphonic it means that regardless of how many sounds it is creating at any one time the total number of notes it can play for all of them is 32 simultaneously.

PUNCH: To assign a particular section of a piece to be over recorded.

QUANTISE: To 'round up' notes, either in time or another specified parameter – often used to ensure that two parts of a piece synchronise pleasantly.

REPEAT: Any specified part of a piece can be duplicated or repeated a set number of times.

SAMPLER: A device capable of capturing sound, encoding it in digital form and reproducing it – usually offers editing and storage facilities.

SAMPLE EDITOR: Sampled sound can usually be displayed graphically and edited. Usually works with a sampler, or stored samples in a disk library.

SAMPLING RATE: The number of times per second that a sound is scanned and recorded measured in KHz (1000's of cycles per second); in general, the higher the sampling rate the better the quality – and the larger the file required to store the sample.

SEQUENCER: Either software or a stand-alone piece of dedicated hardware. A device that stores and organises musical data in digital form; notes, sound changes and controls among others.

Conceptually similar to a very advanced multi-track recorder crossed with a word processor. Input is either as you play it – real time – or note for note – step time. Often, software sequencers can control the internal sound chip of the computer as well.

TOE MODULE: A synthesiser without a keyboard. Usually multi-timbral.

TRACK: A part of the sequencer assigned to recording and playing back one musical part.

VECTOR SYNTHESIS: The technique of using a joystick controller to combine complete waveforms (usually four) to form new ones. First seen on late sequential instruments, but now also on Yamaha equipment.

VELOCITY SENSING: The ability to respond to the force with which a note is struck – keyboards transmit this information, instruments respond to it.

VOICING PROGRAM: Addresses and 'programs' the sound generating chip directly, either the sound chip in the computer or a specific synthesiser. Often involves the use of a graphic display and usually allows sound to be stored to disk.

ZONE: Usually describes the process by which specified areas of a pitched keyboard can be assigned to different instruments, sounds or MIDI channels.

WHERE TO GO FOR THOSE MUSICAL MUSTS

CASIO: Tel: 081-450 9131

CHEETAH: Norbury House, Norbury Road, Fairwater, Cardiff, CF5 3AS

COUGAR AUDIO TECHNOLOGY LTD: Morley Road, Tonbridge, Kent, TN9 1RA. Tel: 0732 350367

FOCAL PRESS BOOKS: Reed Book Services Ltd, PO Box 5, Rushden, Northants, NN10 9YZ. Tel: 0933 58521

FOSTEX (UK) LTD: Unit 1, Jackson Way, Great Western Industrial Park, Southall, Middlesex, UB2 4SA

GEM KEYBOARDS: Bluebridge Music Ltd, 3/5 Fourth Avenue, Halstead, Essex, CO9 2SY

KAWAI UK LTD: Sun Alliance House, 8-10 Dean Park Crescent, Bournemouth, BH1 1HL. Tel: 0202 296629

KORG (UK) LTD: 8-9 Crystal Centre, Elmgrove Road, Harrow, HA1 2YR. Tel: 081-427 3397

M HOHNER LTD: Bedwas House Industrial Estate, Bedwas, Newport, Gwent. Tel: 0222 887333

ROLAND (UK) LTD: Atlantic Close, Swansea Enterprise Park, Swansea, SA7 9FJ. Tel: 0792 700139

SCHOOL OF AUDIO ENGINEERING (SAE): 16 Collingworth Road, London, N7 8QJ. Tel: 071-609 2653

SOUND TECHNOLOGY: Tel: 0462 480000

SOUNDWORKS: Tel: 0993 898484

TANDY: InterTan UK LTD, Tandy Centre, Leamore Lane, Walsall, West Midlands, WS2 7PS. Tel: 0922 710000

TASCAM: 5 Marlin House, The Croxley Centre, Watford, Herts, WD1 8YA. Tel: 0923 225235. Fax: 0923 36290

YAMAHA KEMBLE MUSIC (UK) LTD: Multikeyboard Division, Mount Avenue, Bletchley, Milton Keynes, Buckinghamshire, MK1 1JE

MASTER S.O.U.N.D

Sound sampling Hardware and SOFTWARE for the AMIGA

WHAT IS MASTER SOUND?

MASTER SOUND is a low cost, high quality sound sampler for the AMIGA range of computers featuring advanced Sampling/Editing/Sequencing software. MASTER SOUND enables you to record sounds from devices such as Personal Cassette or Compact Disc players into the AMIGA. When in the Computer, MASTER SOUND'S unique editor will enable you to edit the sound in practically any way you can imagine. Once you have the sample how you want it, you may incorporate it into your own Demo's or programs or use MASTER SOUND'S own BUILT IN sample sequencer to play back the sample along with a number of others too!

THE MASTER SOUND EDITOR

incorporates the following facilities:

- | | | | |
|-----------|------------|--------------|--------------|
| ★ SAMPLE | ★ PLAY | ★ PREVIEW | ★ LOOP |
| ★ CUT | ★ COPY | ★ OVERLAY | ★ WIPE |
| ★ FADE IN | ★ FADE OUT | ★ VOLUME | ★ REVERSE |
| ★ SHRINK | ★ FILTER | ★ MAGNIFY | ★ TRIGGER |
| ★ LOAD | ★ SAVE | ★ RAW FORMAT | ★ IFF FORMAT |
| ★ SCOPE | ★ FFT | ★ VU METER | ★ SEQUENCER |

The impressive realtime Spectrum Analyser and Oscilloscope enable the user to monitor frequency content and volume with ease and help you to ensure that the sample quality is at its best.

THE MASTER SOUND SEQUENCER*

Allows you to play back samples in a sequence. Multiple samples can be held in memory at once and sequences are as simple to record as tapping keys on the computer's keyboard. Once recorded, the Sequencer can save the samples and sequence file out onto disc so that the files can be used in your own demo's.

THE MASTER SOUND DEMO

Allows you to play back your own sequenced sounds from the sequencer while displaying IFF picture files. This is great for creating your own public domain demo discs without having to be a computer programmer!



MASTER SOUND EDITOR



© MICRODEAL 1990
ALL RIGHTS RESERVED

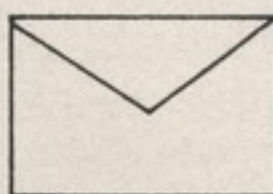
MASTER SOUND ORDER FORM

Master Sound is £39.95 post & packing £1 (all prices inc V.A.T.)



**BY PHONE
WITH
CREDIT CARDS**

(0726) 68020



BY POST: with Cheque · Postal Order · or Credit Card

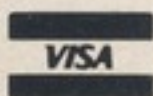
Name

Address

Post Code

Credit Card Type Expiry Date

Number



Please allow 28 days for delivery

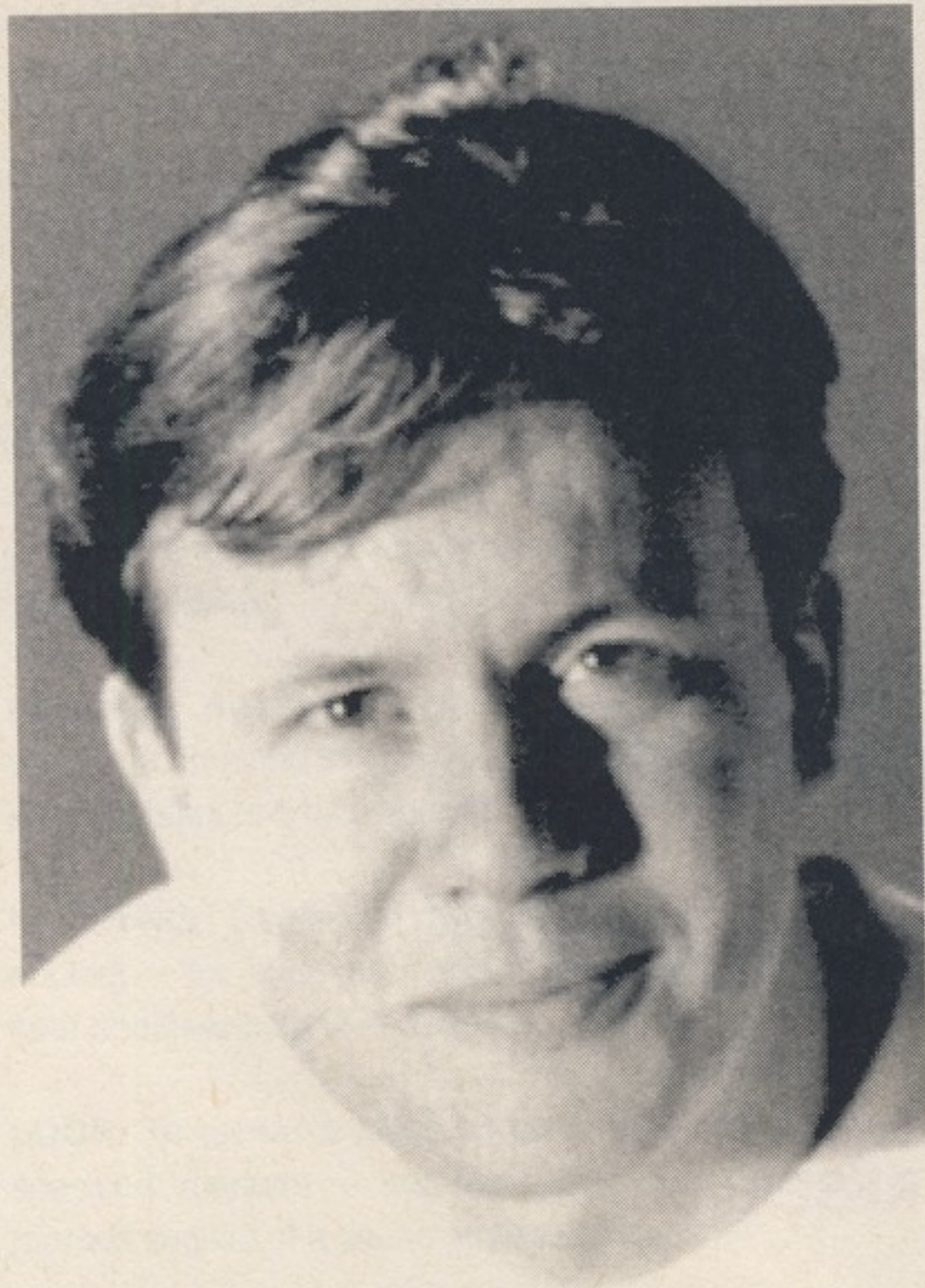
Send to: Microdeal · PO Box 68 · St Austell · Cornwall · England · PL25 4YB

IN SEARCH OF CHART SUCCESS...



So you've produced a stunning piece of music – what do you do with it? Apart from touting a tune around the record companies, there's always the option of selling it to a game publisher. But what are they looking for?

The Bitmap Brothers made quite a stir when they entered the games market – apart from the fast 'n' furious arcade action they offered the joystick-wielding public, Bitmap games offered a little extra in the music department. Suddenly chart stars were providing tunes to accompany the sprites... Maybe this could be another route to fame and fortune for a composer equipped with a computer? *Express* asked Eric Matthews, a brother Bitmap, what the score was...



Eric Matthews: "More and more, music is becoming a valid part of the computer publishing world..."

Ever since *Space Invaders* was first written for the ZX81, pundits have been drawing parallels between the games industry and the pop business. And like parallel lines, the two industries have never quite managed to meet. Sure, Virgin launched its own software label. Sure, the odd popster dabbled an experimental toe into programming – like Pete Shelley and the man who hides behind the Frank Sidebottom mask. But mass-market music and shoot 'em ups never really mixed.

But the Bitmap Brothers have teamed up with record label Rhythm King to set up a games label – Renegade. Now that the music publisher behind such acts as *Betty Boo* and *Bomb The Bass* is on the scene,

is music for the home computer about to find chart success? *Express* asked Eric Matthews about the future of 16-bit music...

Express: If someone wanted to send in a piece of work for possible inclusion on a Renegade game how would they go about it? What format is preferable?

EM: Well opening sequences for games are the places where music is at its most obvious, so a short, maybe two-minute, sequence is a good way to get an idea of a person's output. Short samples are better than great long repeating chunks – in fact we are trying to get away from the irritating loops of music which have tended to be associated with games.

Express: And which are the best machines when it comes to playing a mean tune?

EM: Well, obviously the Amiga. The ST can be a bit of a pain because getting good samples into it tends to slow the game down. And the Sega MegaDrive and the Nintendo system have really good sound chips as well.

Express: Why the Amiga?

EM: Basically because it has such an excellent sound chip – it's very nearly a synthesiser in its own right.

Express: Do you actively encourage submissions from the public?

EM: We're not *really* set up for that kind of thing. We tend to use professional musicians for soundtracks, and now that we are working with Rhythm King the options are even wider.

Express: What kind of reaction do you get from 'pop stars' when you include their music in a game?

EM: Mostly very positive. Our next release, *Gods*, includes music composed by *Nation 12*. I remember John Foxx coming in and looking at one game running on the Amiga and being amazed.

Musicians seem to have the idea that the sound with games is just beeps and whistles – so when they see and hear something like *Speedball 2* running, the reaction is normally: "Wow! this is just the same as a high quality recording!"

Express: So could you see music becoming more important in the computer industry?

EM: When we used *Bomb The Bass* on *Xenon 2*, the soundtrack alone got an amazingly good reaction from the public. It's clear that if you use quality sound tracks on quality games, the combination has to be excellent. But there's more that can you do with music – we want to start using music more for atmosphere. It would be nice to use a soundtrack that tied in with the graphics.

Express: Like film music?

EM: Yes, very much so. We are trying to tie in a soundtrack with changes in action and graphics. But I don't really want to go into it too much now...

Express: Would it be possible, in a graphic adventure say, to have the backing track change when a character picks up an object or changes room?

EM: That kind of thing, yes. Basically it would be good to move away from the boring old repetitive sounds.

Express: Bearing in mind the way film or TV soundtracks can cross over into the pop world – like the *Twin Peaks* theme – could you see a day when a computer game sound track might make it into the charts?

"...it's funny that you should say that, but we had thought of remixing the *Speedball 2* theme and releasing it as a single in the future..."

EM: It's funny you should ask that but we had thought of remixing the *Speedball 2* theme and releasing it as a single in the future.

Express: So music is becoming more important to games, and we could see computer game musicians making it into the mainstream music charts?

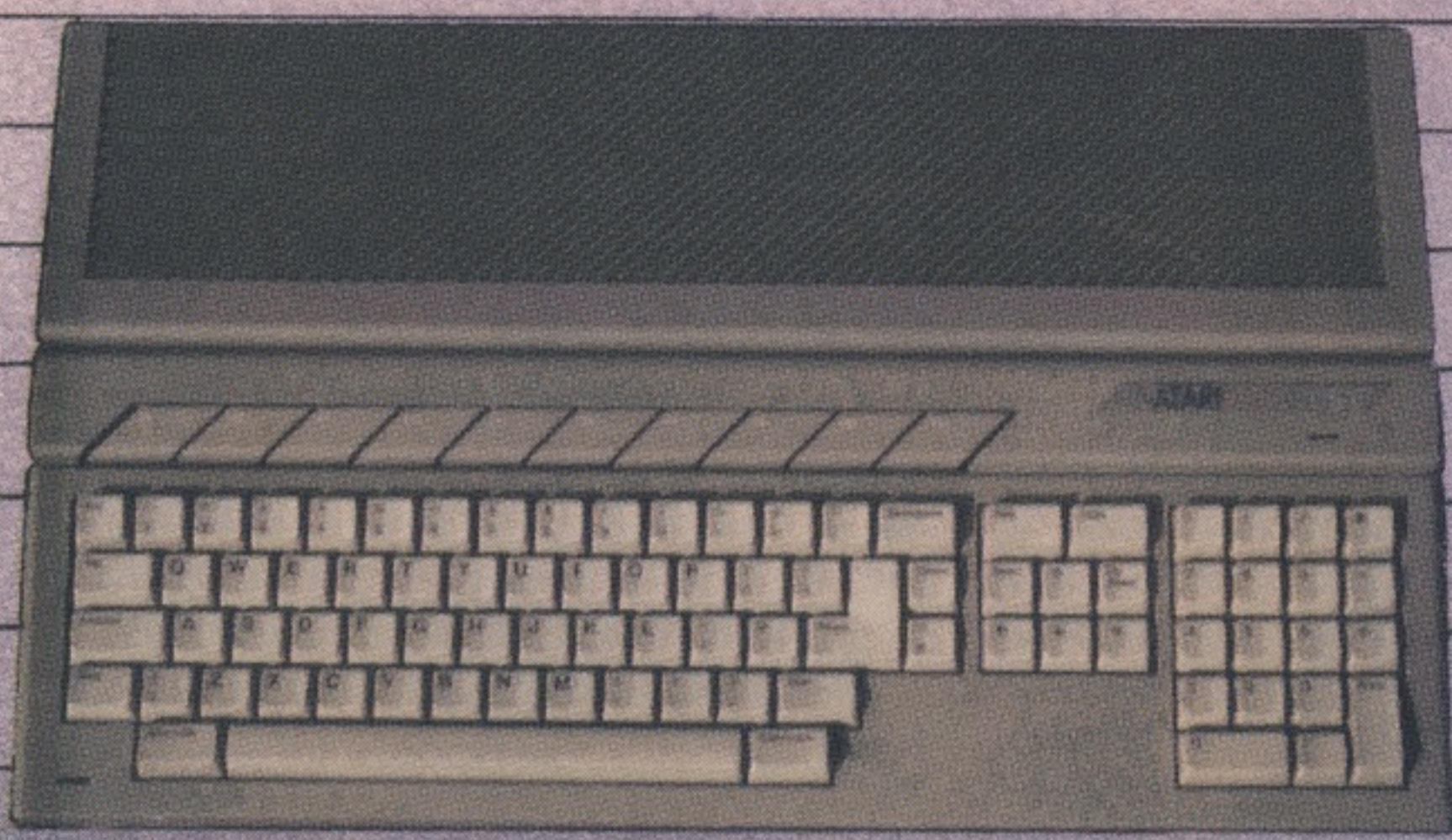
EM: One day, definitely. Yes.

It's happening in Japan with CD remixes of console game soundtracks. And what happens in Japan today happens over here the day after tomorrow. Dust down your sampler and get sequencing!

ATARI ST

"E" & "FM"

TURBO



also available the 520STFM Discovery Pack!

£299.00 inc. the DIGISTAR pack!

The Official NEW Atari 520STE Turbo Pack has arrived!

pack includes

- ✓ Atari 520STE Computer Keyboard
- ✓ 512K built in Random Access Memory
- ✓ Built-in 1 meg Double-Sided Disk Drive
- ✓ Built-in TV Modulator
- ✓ Superb 4096 Colour Graphics
- ✓ 8 Channel Digital Stereo Sound
- ✓ Four Joystick ports
- ✓ Light Gun/Pen Facility
- ✓ MIDI inputs for music keyboards
- ✓ RAM Expansion capability
- ✓ Atari Mouse and Joystick
- ... and all connecting cables to get you up and running on your home TV set!

plus

- ✓ Indiana Jones and the Last Crusade
- ✓ Dragon's Breath
- ✓ Blood Money
- ✓ Impossible Mission II
- ✓ Human Killing Machine
- ✓ Anarchy
- ✓ Outrun
- ✓ Super Cycle

plus

- ✓ STOS Games Creator
- ✓ Hyperpaint II - uses all 4096 colours!
- ✓ Music Maker II - uses the new stereo sound!
- ✓ First BASIC Programming Language

plus FREE DIGISTAR pack

10 great software titles and accessories worth over £200 - Only from DIGICOM!

- ★ Drivin' Force
- ★ Trivial Pursuit
- ★ Pipemania
- ★ Rick Dangerous
- ★ Chess Player 2150
- ★ Metacomco BASIC
- ★ Rock n' Roll
- ★ Asterix
- ★ Skweek
- ★ Onslaught
- ★ Live & Let Die
- ★ Mouse Mat

Total package price includes VAT and Next Day Delivery by Courier*
Don't delay - Order now! 24 Hour Credit Card Hotline Telephone (0908) 378008

How to Order



By Phone - Call our Credit Card Order line on (0908) 378008 and quote your card number and expiry date along with the details of the goods you require. We accept ACCESS, VISA, EUROCARD, MASTERCARD, AMEX the new Direct Debit cards like Barclays Connect and we also accept Lombard CreditCharge Cards.



By Mail - Simply write down your requirements and send in your order to us by post along with a personal cheque, bankers draft, building society cheque or postal order made payable to "DIGICOM COMPUTER SERVICES LTD".
 *Please note:- Personal cheques require 7 days clearance before despatch.

Next Day Delivery is Mon-Fri - Saturday Delivery is £3.00 extra

Catalogues!

Ring or write in for our latest Atari catalogue listing hundreds of products available for this versatile Home Computer. We stock COLOUR PRINTERS, STEREO COLOUR MONITORS, EXTERNAL DISK DRIVES, MEMORY EXPANSIONS, HARD DISK DRIVES, Atari BOOKS, FRAME GRABBERS, DIGITISERS, SCANNERS, WORD PROCESSORS, DATABASES, SPREADSHEETS, ACCESSORIES and of course hundreds & hundreds of games and all at well below recommended retail prices!

Service you can depend on!

Digicom offer you the very best in customer after sales support with 12 month warranty on all Computer Hardware. All units are full UK specification with 30 day replacement guarantee on faulty items and FREE collection of the defective units within this period. And should you ever need any technical advice our experienced and helpful staff are available on the telephone or in our showroom. Remember - there are no hidden extras - all prices are fully inclusive of VAT and next day courier delivery.

Prices & Specifications are subject to change without notice E&OE.

only.....

£379⁹⁹

or spread the cost with our finance facilities - written details on request.

DIGICOM

36-37 Wharfside Watling Street
 Fenny Stratford Milton Keynes MK2 2AZ
 Telephone (0908) 378008 - Fax (0908) 379700
 Showroom Hours - Mon to Sat
 9.00am-5.30pm

AMIGA ADAGIO

Damien Noonan takes a close look at the Amiga's musical potential.

The world of Amiga music is actually quite simple, although it can at first sight seem rather complex. It is also very enjoyable and rewarding, although it can at first sight seem rather complex. It is also very enjoyable and rewarding to get into, even if it's only at the level of buying music demos from a PD library and whacking it through your hi-fi – remember that the Amiga produces full stereo sound and has ordinary phono outputs, so all you need to hitch it up to the sound system in your living room is a phono lead, as supplied by any hi-fi shop.

Down to the nitty gritty. The Amiga's capabilities when it comes to sound-making, rather like close encounters, split into three obvious kinds – creating, recreating and organising sound. You could look at these as the three Ss – synthesising, sampling and sequencing.

THE FIRST KIND...

Ok, so let's cut the simple stuff and get into a bit more detail. The first of these ideas, creating sound, is mainly concerned with the Amiga working entirely on its own. The Amiga has a dedicated soundchip called Paula, which is in effect a synthesiser in itself. All you have to do is listen to the kind of music written to accompany Amiga games. This is exactly the sort of thing that Amiga music of the first kind involves – the Amiga, on its own, playing music. There are packages available that will help you write music for games. There are also programs that will allow you to make music just for the sake of it, but still involving nothing more than the Amiga – no instruments, no expensive equipment.

THE SECOND KIND...

Amiga music of the second kind also is based around a capacity of the machine itself. The soundchip is blessed with another very advanced ability, the ability to convert sound from a digital form to an analogue form and vice versa. For anyone not familiar with these terms, analogue sound is the kind of stuff our ears actually hear. Let's take a moment for a simple explanation.

The loudspeakers of your hi-fi system or your ghetto-blower work as follows: an electric signal makes the speaker vibrate, pushing the air in front of the cone

out in waves. Your ear works almost the other way round – the waves of air push your eardrum backwards and forwards and this movement is converted into what your brain perceives. So sound is no more than vibrations of air.

OK, that's 'analogue' sound. Note that because the air is moving forwards as it is pushed along by the speaker it moves in waves – very much like waves in water. The closer together the waves are, the higher-pitched the sound is. Equally, the further apart they are, the lower the sound.

The number of waves there are in a given time is known as frequency, usually expressed in waves (or 'cycles') per second – or 'Hertz'. A low-pitched bass sound may be as little as 7 or 8 cycles per second (7-8Hz), while a treble sound may be as much as 17,000 cycles per second (17KHz). The highest sound the average adult can hear is about this level.

DIGITAL DYNAMISM

So, what about digital sound? Well, digital is the system used by Compact Disc players. The sound waves are sliced up into bits. You can think of it best as a graph. If you drew a curve going up and then down again on graph-paper, that's like an analogue sound. Alternatively, you could plot it as a series of points and deduce the shape of the full curve from where the points are. That's how digital sound works.

Now back to the Amiga. In order to make a digital sound audible, it must be converted to analogue before being passed to the speakers. The Amiga's soundchip contains a digital-to-analogue (or D-to-A) converter which does this vital job. Now obviously this doesn't make it into a CD player. What it does do, however, is open up the whole world of sampling. Sound can be fed into the Amiga from any analogue source, be it a microphone, tape, CD, record deck or video recorder and sliced up into digital information. As digital info it is in effect just like computer data and can be stored on disk.

Sampling is how the Amiga makes sound of the second kind, recreating sound from the environment around it. Samples can also, just like the Amiga's own synthesised sound, be made up into complete tunes or incorporated into music. There are pure sample players

around that can write tunes from samples – for instance, by pinching a drum track from one place, synth sounds from another place and vocals from somewhere else. And remember, too, that even hit records nowadays, especially of the Acid House kind, do it this way.

THE THIRD KIND...

Our close encounter of the third kind with Amiga music takes the form of organising sound. This is simply another way of saying you can write a whole tune using your computer. 'Sequencing' is the most obvious form of this: a tune is broken down into a sequence of 'events', such as a drum beat happening every so often, a bass punching out notes every so often too, and so on. If you think about it, the idea of music as a sequence of events is perfectly logical – all traditional written music works on the same principles of when something happens, what that something is and how long it happens for.

Sequencers tend to work on the same principle as recording studio tape recorders do – generally they have a number of tracks with one instrument being played on each track. The concept is really very simple.

INTRODUCING MIDI

The term MIDI will crop up an awful lot in any discussion of music. MIDI is the Musical Instrument Digital Interface, a standard code by which all electronic instruments, such as synthesisers, can be made to operate.

All you have to do is buy a MIDI interface for your Amiga, a fairly simple gadget costing as little as £20-30. With this you can then control most electronic instruments. Instead of having to play them, you can now control them from the Amiga. You could write a song using a sequencer package on the Amiga and just sit back and let it play the song using as many digital instruments as you have space for.

Damien Noonan edits Amiga Format magazine. These extracts were taken from his book Getting the Most from Your Amiga, available from Future Publishing Ltd, The Old Barn, Somerton TA11 7BR. It costs a very reasonable £9.95.

Recommended software

As we have seen, the Amiga is just bursting to make music. In terms of hardware it's an excellent option. But what about the software to match it?

First, and maybe surprisingly to some people who never bother with anything under £30, you should look in the Public Domain. Here you will find cracking demo tunes to show you what is possible, such as the Titanics Acid House disk, which is practically an album on a floppy. Also available to the seeker of quality bargains, here too you will be able to get whole sample sequencers which you can then use to write your own Amiga-only tunes. There are many ready-written songs lurking around too.

For games writers who don't have a music expert to help, *TFMX Soundtool* (£44.95, The Software Business) is

a good bet. Elsewhere among simple beginners' programs, *Sonix* is very good if you can get it (Aegis, about £30), especially because it displays tunes in music notation, so you can type tunes in from sheet music.

Samplers are a combination of hardware and software and currently the best software around is *AudioMaster 3* (Oxxi-Aegis, varies with hardware deal). It can be bought hand-in-hand with lots of different hardware, but the best (and most expensive) is the *Audio Engineer* package (£199 from HB Marketing).

At the serious end of MIDI sequencing, *Music-X* (The Software Business, £129) has made a very strong bid to establish itself as a standard. It hasn't quite managed it against intense competition from a number of other decent sequencers, but it is good.



• Audio Master III, highly rated.

Hear Tomorrow Today!

26 - 28

April

1991

Novotel,
Hammersmith,
London W6,
Great Britain

*The only show
in **Europe**
dedicated to
**MIDI Music
Technology**
for both
**professional
users and
enthusiasts***

- **Try the latest products from all the major manufacturers**
- **Meet industry personalities**
- **See in-depth seminars covering all aspects of MIDI**

Organised by
Westminster Exhibitions Ltd,
Surrey House, 34 Eden Street,
Kingston, Surrey KT1 1ER



Sponsored by:

MAKING
MUSIC
Britain's biggest
musician's magazine
and **WHAT'S MIDI**

EXTRA!

By public demand, Friday 26th is **High End Digital** day featuring seminars and presentations by market leading companies demonstrating Direct to Hard Disk recording, Tapeless studio systems, using MIDI live, DAT production and a whole new world of state of the art recording techniques

The enormous success of the first **MIDI Music Show** established this event as the major showcase for all things related to MIDI.

Visitors were not only able to see, try and buy the latest equipment but could also discuss MIDI with those at the forefront of this exciting technology: The MIDI manufacturers and the professionals who use it.

Now, for 1991, we present **The Second MIDI Music Show**, an event which will be even bigger and more entertaining.

Every major manufacturer in the field is already committed to the show. Many will be using it to

launch and spotlight their newest products.

A programme of seminars, in which you can guarantee a place in advance, will cover all aspects of MIDI in : ♦ the professional recording studio ♦ live performance ♦ home studio. Many of these informative presentations feature well-known industry personalities. As with last year's seminars, we expect that you, the visitors, will prove to be active participants in this most valuable feature of the MIDI Music Show.

In short, if you have any kind of interest in MIDI music, then you can't afford to miss **The Second MIDI Music Show**

To: Westminster Exhibitions Limited, Surrey House, 34 Eden Street, Kingston, Surrey KT1 1ER

Please send me _____ (qty.) priority tickets for the Second MIDI Music Show @ £3.00 each

I enclose a cheque for £ _____ Please send me details of the SEMINAR PROGRAMME ☐ ☒

Name _____

Address _____

Postcode _____

**Save 40%
on Admission**

Book now!
**Avoid the queues
and SAVE MONEY.**

Admission at the door will be
£5.00. Book your priority tickets
now for **only £3.00 each!**

PACKAGE IDEALS

Jon Bates looks at hardware set-ups from the humble to the ultimate dream machine.

The prices used are the manufacturer's recommended ones, but a few hours spent window shopping around, scanning adverts, plus the odd phone call may well turn up keener prices, particularly if you are buying more than one item for cash.

Whatever system you choose it should be something that you feel you can get the best out of, and that is open to upgrades and improvements.

MIDI is going to be mentioned a great deal (for explanations of these jargonese terms turn to glossary the on page 30). This has now become the standard system for computer music; you can view it as being equally as important as an operating system such as MS-DOS or TOS. As with any O/S, MIDI is being constantly reviewed and improved. However, once your computer has MIDI capability you are set up for years of music-making.

And the beauty of MIDI itself, and in fact any MIDI music system, is that you can add to it without having to throw anything away through obsolescence.

ULTRA LOW COST

Under £500

Let's face it, £500 is a lot of money. You have probably already spent that just buying your computer. So, is it possible to set up for less than this? Well, the good news is – yes.

My first stop would be to buy one of the many single keyboards that proliferate in the market. Obviously it would have to be equipped with MIDI otherwise you are really wasting your time. The bottom line is that these dinky things are in effect multi-timbral modules. They can usually be addressed on about five channels of MIDI simultaneously since in their normal life as a self-accompanying keyboard they need to generate this many sounds, including drums, at the same time. Thus in one box you get a keyboard that can input notes, as well as a basic, but sufficient, tone module.

The second-hand market is rife with these instruments but you will need to have a rough idea of what you want. The deciding factor comes when you audition the sounds. A point to bear in mind is that the sound is often emerging from rather inferior speakers within the instrument and could improve with decent amplification.

Favourites to look out for second-hand are the Yamaha PSS480 and 680 both of which have a pretty decent set of voices. These should come in at about the £200 mark at the most.

What follows is a quick look at the most prominent models – there are many others.

Package 1

EVS-1
FROM Sound Technology
PRICE £299
PLUS
PC-200 MIDI keyboard
FROM Roland
PRICE £175

Instead of using one instrument to carry out all of the work we could have a separate MIDI keyboard in tandem with a tone module. In this case the tone module is capable of producing more than five voices at one time.

The EVS-1 tone module from Sound Technology - a company which has gained some renown in the rising world of computer music, is an amiable and workman-like beast, and at just under £300 it is quite a good bargain, offering plenty of ways to create sounds with 24 bit clarity. It is also able to play 16 notes simultaneously as well as eight different 'sounds'.

ST owners (and bear in mind that many of your favourite stars – OK and the ones you hate as well – use STs) also get a voice programming and librarian disk. This can come in rather useful as, apart from 80 preset sounds and two drum kits which are available, you can program 20 of your own sounds in too. Combine this with a remote keyboard from Roland, the PC-200, which will set you back £175. This keyboard will control pitch bend, MIDI patch change, and is velocity sensitive. Total bill is £475, just within budget.

CONTACT DETAILS

Roland (IUK) Ltd
Atlantic Close, Swansea Enterprise Park,
Swansea, West Glamorgan SA7FJ
TEL: 0792 700139. NB. Roland also handles the Boss range of effects unit.

Sound Tecnology,
Letchworth Point, Letchworth, Herts SG6 1ND
TEL: 0462 480 000

SINGLE KEYBOARDS

PSS 590
FROM Yamaha
PRICE £149.99

A good basic instrument with a four octave mini keys, 28 note polyphony, 100 sampled voices. For those budding popsters, percussion makes this one of the best bargains around for the beginner.

PSS 790
FROM Yamaha
PRICE £229.99

Specifications are the same as the 590 but an



extra octave of keys has been added. There is also the option to create your own sounds and blend them thanks to the joystick control. It also has a pitch bend wheel so you can bend notes to your heart's content and have the sequencer faithfully reproduce them. You can also dump voices via MIDI.

PMP-700
FROM Casio
PRICE £349.99

Five octaves of full-size keys, sound editing plus digital reverb. You have a respectable 200 sounds to play with plus five channels of decently-specified MIDI. The ubiquitous pitch bend wheel is also included.

SPECTRA KC10
FROM Kawai
PRICE £450

Five octave velocity-sensing keyboard with pitch bend that builds on the sounds made famous by Kawai's K4 synth using 16 bit samples that are combined into new voices. You can play five sounds at any one time and program up to 32 of your own. Also on the menu are stereo output and 64 preset sounds made from 128 wave-forms.



CONTACT DETAILS

YAMAHA KEMBLE MUSIC (UK) LTD
Multikeyboard Division
Mount Avenue, Bletchley, Milton Keynes,
Bedfordshire, MK1 1JE
TEL: 0908 371 771

CASIO
Unit 6, 1000 North Circular Road, London NW2 7JD
TEL: 081-450 9131

KAWAI (UK) LTD
Sun Alliance House, 8-10 Dean Park Crescent,
Bournemouth BH1 1HL
Tel: 0202 296629

LOW COST £500 - £750

The next step up the ladder gives us a little more flexibility; a more powerful synth or tone module with remote keyboard. It goes without saying that you can perm any two from the 'packages' I have suggested. One good suggestion would be to shop around for a second-hand DX7 - the synthesiser which launched a thousand singles. Although not multi-timbral it has more voices available for it than any other synth. You should get an old one now for about £400 and they make very good master keyboards that also create sounds that can still cut it with the best.

PACKAGE 1

£544

ROLAND CM32L £369
PC-200 keyboard £175

Roland have made their neat CM range of multi-timbral modules especially for use with computer sequencers. They fit neatly under the monitor and

come in three varieties. This package uses the CM32L - 8 LA synthesized voices plus PCM drums simultaneously. The PC-200 keyboard provides the pleasure of 32 notes simultaneously.

As a word to the wise, I could have chosen the CM32L's stand-alone equivalent, the MT32, which is about the same price nowadays.

PACKAGE 2

£674

YAMAHA TG33
ROLAND PC-200 keyboard

The TG33 is the all new and improved modular version of Yamaha's successful SY22 synth that uses Vector Synthesis to create sounds. 128 sampled waveforms and 256 FM waveforms combine to produce stunning effects.

At your disposal are 32 notes on any combination of 16 MIDI channels, although this diminishes the more complex sounds you create. The controlling joy-

stick on the module combines different sounds to produce an almost infinite variety. If you tire of that there is a random voice-creating function plus 16 on-board digital effects. All this for £499 plus £175 on Roland PC-200 keyboard described previously.

Package 3

£744.95

ROLAND CM32P
CHEETAH 5V KEYBOARD

The CM32P is from the same series as the 32L described above, but offers sampled voices and enhanced percussion - 32 notes, 8 voices plus drums all at one go for £445.

The Cheetah 5V has the advantage of 61 full-sized keys, 4 independent MIDI outputs (for expansion later), 8 definable key zones, MIDI effects, three definable controller wheels, velocity and release sensitivity (no aftertouch though) and 80 performance memories all for £299.95.

MEDIUM COST

£750 - £1000

Even more choice for the discerning buyer. For example you could beat Yamaha's SY22 which retails at £799 by combining the TG33 with the Cheetah 5V keyboard, thereby getting full size keys with lots of control for 5p less (although you might lose out on Aftertouch).

A little more shopping around and you should turn up the rather specified Korg M1 within this price range; this little baby comes with the ability to produce 8 sounds simultaneously that you will love as soon as you hear them because

they've been used on virtually every record this side of 1988.

Also into this price range goes the Roland D series of synths, although the D50 is not really worth having as it is not overtly multi-timbral and the new D70 is holding its price tag.

Package 1

£964

ROLAND CM64
PC-200 KEYBOARD

Put the Roland 32P and 32L in one box and you get the CM64, which costs £789. 15 MIDI channels and 63 notes simultaneously plus digital effects. Throw in the small keyboard, plug it in and have over 230 sounds to

go at. All the Roland modules can be programmed from voicing programs like the Gajits range.

Package 2

£974.95

CHEETAH SX16 SAMPLER
PC-200 KEYBOARD

Now here's a thought; Cheetah sell this budget sampler at £799.95. Its half megabyte memory can be expanded up to 2Mb. It has eight polyphonic outputs, up to 48Khz sampling rate and despite some quirky editing it ain't half bad. What's more it reads sample disks for the popular Akai S900/1000 range. Put the PC-200 keyboard, or any low priced MIDI keyboard with it and you have a very versatile system indeed.

HIGH COST £1000 - £1500

Now we are starting to get serious about our music. The bottom end of the true giants amongst synthesisers start within this range and you may well be tempted to save up and splash out for some high-quality hardware.

Needless to say the choice is wider as well since you can pick and mix various items that we have already covered: for example adding a TG33 to the Cheetah sampler. It is always a good idea not to go for two instruments that create sound in the same way - say a couple of LA Synthesis synths.

They may well be different in specifications but there is a familiarity about the sound; variation is the spice of sound. Herewith are various items that you might consider if this is your price bracket.

£1399
GEM WS2

This is a real turn up for the books. Gem has been known for years for turning out chintzy-sounding naffish keyboards that look great when you decorate them with dahlias. But the WS2 is a complete departure. Spawned from their acquisition of a chip factory back in Italy they have come up with a self-contained single keyboard that has a demonic selection of sampled voices that you can change at will. Although it would

appear at first that you can only have five channels of MIDI, you can in fact assign more sounds to each channel and either zone or layer them. In fact it has full MIDI specifications plus internal effects - lots of them that you can set up for each MIDI channel independently. It also has a good keyboard and pitch/modulation trackball. If you can't work out how to dump the patches and voices via Systems Exclusive then an extra £299 buys you a disk drive for it.

£1499

ROLAND W30 WORKSTATION

Basically it's an S330 sampler bolted on to a keyboard. The sampling side is extremely competent: Half a megabyte of memory with filtering, sample editing, layering, velocity setting and floppy disk storage.

It can hold up to 30 seconds of samples in total, but the clever internal architecture means that you can get far more out of it than it would first seem. Eight multiple patch settings, full MIDI control plus a decent keyboard all under one roof.

£1050

YAMAHA SY55

This is a synth with full multi-timbral capability that uses AWM (Advanced Wave Modulation) samples to create its sounds in several ways; 64 permanently on board with 64 to load in plus 32 multiple memories.

Add to this a module like one of the Roland CM series, an EVS1, or Yamaha's own TG33 and you have a fairly formidable set-up complete with controlling keyboard to boot.

£1575

KORG WAVESTATION

Just outside our upper limit but still very tempting is the Wavestation. In quite a lot of respects it is like the older analogue-style synths. It uses vector synthesis which allows great scope for experimentation and produces some incredibly complex sounds quite apart from the usual ones.

As a multi-timbral synth the Wavestation is more than adequate. Its keyboard is perfect as a master controller as it can transmit on up to eight channels simultaneously all set up in layers or zones. With a total of 365 sampled waveforms sealed into its ROM it can store 105 single voices and 150 combination voices.

It can play 32 notes simultaneously via all 16 channels and your sequencer will remember the real time changes that the joystick control makes when you are mixing and creating sounds, thanks to the full use of the MIDI language. Extra memory and waveforms are available on cards. It is a unique and amazing instrument the options of which would take an age to exhaust.

£LOADS THE ULTIMATE SYSTEM

First of all you need an array of multi-timbral modules to cover all eventualities. These will need to have varying methods of sound creation for the widest possible scope. To this end you could take in the TG77 Yamaha module – the rack mount version of the SY77 flagship synth. This offers eight individual outputs and 11 different methods of sound creation using samples, FM (advanced), and permutations of these two methods: Sounds stacked on top of one another and sounds created by taking slivers of one sound modulated by another.

Needless to say it has card slots and a disk drive plus full on-board effects units. Although horribly complex to program, it has the ability to mimic virtually any other synth. With its full potential yet to be explored I predict a considerable shelf life. A couple of these will do nicely at £1,299 each.

Keyboarding

The main keyboard could be the Korg T1. A full 88 notes weighted like a piano but with velocity and after-touch sensing. Since it is a full-race synth in its own right with very capable MIDI features it has a whole host of excellent Korg-type sounds on board, all of which make it an ideal controlling instrument. It can also accept samples from any other sampler capable of dumping them in MIDI format which will make it ideally suited for live work.

For the real fat analogue sounds why not add one of the Midimoogs – in reality just an old Minimoog retro-fitted with MIDI and rack mounted to save on space. Just to add spice to this why not add the MIDI'd up version of the Prophet five – a synth with a unique fat sound much used in the mid-70's.

Sampling

Samplers are essential for any serious system. I recommend two options here: Rolands' new S770 has enormous potential not only for sampling and sample playing but for creating totally new sounds from the samples. An on-board hard disk aids storage/retrieval size and speed; both CD ROM and magnetic/optical disk units are optional extras. Its memory can be expanded from an initial 2Mb to 16Mb. This little lot will set you back about £15,000 including the colour monitor to edit with. The alternative is the Akai S series which will probably work out at around the same price for the same facilities.

Although most people buy samplers with the intention of creating many of their own – for samples of 1960's 'cult' TV shows or even Margaret Thatcher most professionals rely on the CD or disk libraries specially created for the sampler market.

It takes a long time to get samples sounding exactly right and this justifies fitting a hard drive to the samplers. If you have several banks of samplers a read/write optical disk is a must since it will take some time to stuff the many megabytes of sampled sound into the samplers.

Recording

There is but one option – hard disk recording. The Digidesign *Sound Tools* system running on the Macintosh would fit the bill as we can also link it up to other devices such as videos and multi-track machines to give a complete time locked system. By using samplers and direct-to-disk recording, songs/music cues and dialogue can be shuffled about – compressed, expanded, and lined up – with ease.

The *Sound Tools* system runs on a Macintosh and to make things work efficiently you will need an access time of better than 28ms. If you consider that one minute of stereo recording eats up 10Mb of disk space you are going to eat your way through rather a lot of memory pretty fast. Back-up systems are a must.

Maybe you might be better off running two computers in tandem – say a Macintosh for the digital recording and an ST, another Mac or Amiga for the MIDI side, and then just synch them together. However, we have spent a lot of dosh just on this alone. Forgetting the cost of the micros, there is still about £10,000 to find and our overall bill is getting near the £100,000 mark.

The Big Guns

So why not forget the bits and pieces and really go for broke in one spree. How about a machine that can create and store all the voices and samples you want, running 96 sounds simultaneously from a 200 track sequencer, and keeps 396 voices at hand and 128 MIDI channels in command at all times. Couple this with a built-in digital mixing desk to record to disk.

Now for some storage. 16 640Mb hard drives should do, enabling us to have a two hour 16 track digital master stored and then mixed down to digital stereo. All this is quite apart from the 320Mb systems disk and 30Mb hard disk needed to just get it running. You will also need a keyboard, and maybe a few hours of instruction. If you already have all this then you've spent a shade under £400,000 on a Synclavier 9600! system with a few additional extras – but not all of



• The Synclavier. £400,000 worth of dedicated music hardware and software, which most of us can only lust after.

OF MUSIC AND COMPUTER FAIRS

Oddly enough, the gap that at one time formed a clear division between a computer fair and a music fair is now closing fast. At many computer shows there is a fair size area devoted to showing off the latest music software, often in association with the latest synths and tone modules. The converse is also true of music shows; many stands are taken up with software companies promoting their latest wares.

Although there are a large number of fairs in the UK, it would be true to say that quite a few of them are a reasonable excuse for an indoor market where the idea is for the stall holder to shift as many boxes of merchandise as possible. For the punter this often offers quite a good deal as the prices, particularly on the afternoon of the last day, are usually very competitive. However, there are really only a few fairs that the manufacturers and software houses target to launch new products. It is on these that we will focus our attention as to keep abreast of the tidal wave of innovation this is where you need to be. You will also find that these fairs attract the press merchants, like myself, who will duly report the unveilings in *Express*.

The prime show in the UK is what used to be called The British Music Fair. This annual bun fight is usually held at Olympia in Kensington around about mid-July. According to the press release, the fair continues to grow in stature and size; so much so that this year it has been decided to widen its scope. It will now include the rest of the world and, "embrace any product or service including warbling Christmas cards, singing strippergrams and trained canaries".

Joking aside, the show inevitably has quite a few firsts on display in both music hardware and computer-related products and software. This is because it is perceived by many international companies as a very important market and one that is densely populated in terms of computers and electronic instruments per head. The hardware tends to be exhibited by the manufacturers themselves and not the shops or dealers, although some of the main importers will have a stand with areas dedicated to brand names. Software is usually on the importers' stands and often two or three

Now that computers and music are firm companions we look at the cross-over which occurs at annual industry events.

software companies will be represented on one stand, except for the larger European and UK software houses.

Perhaps its main drawback is that it is staged in London – very handy for most of the exhibitors but a real pain if you have to travel there. Even if we take someone travelling from somewhere in the middle of the country, say Sheffield, a one day visit will work out rather expensive. You will need to catch Inter City trains at their premium rate (unless you want to arrive after mid-day) and that will probably only leave you with about six or so hours there. That might sound a lot but in fact it will soon disappear. Add to this the entrance fee of about a fiver, the rather over-priced and inade-

The British Music Fair will embrace any product or service including warbling Christmas cards, singing strippergrams and trained canaries.

quate catering facilities, and it might be a bit off-putting. To test the theory of this, there was a second music fair staged in Manchester last November which proved to be quite successful. Although by no means the size of the London version it did, nevertheless, attract over 6,000 visitors. With the introduction of a special Education day this year a regional show would have been just the thing: imagine herding from 4B from Euston to Olympia and back and you'll get a rough idea of why.

This year's show runs at Olympia from the 10 – 14 July. The first two days are for trade preview so unless you have a trade ticket, hard luck. Friday 12 is the Education day and Saturday 13 and Sunday 14 are public days.

The largest music fair is held in Germany; in Frankfurt to be precise. This yields an unbelievable number of exhibitors – well over 900 – in three vast halls, each usually having several levels. These are just three out of the 10 exhibition halls that make up the Frankfurt Exhibition Centre. Every software house that produces music software is represented, each usually with its own stand. It is interesting that there is quite a lot of software from both Europe and America that is simply not available here, usually because there is no importer.

Apart from that it is the show where exhibitors try to outdo one another, making a great effort to have the new products up and running. This can, of course, lead to what is known in the trade as 'vapourware'. You see it at the show and the next time you see it is at the same show the following year – still in the development stage. This is something of which to beware. Quite often the soft or hardware on display is a prototype only and the time lapse between seeing it demonstrated and having it on your screen is considerable. The major manufacturers try to avoid this, but there again they can often afford to wait, whereas the smaller software house will need to drum up interest in their product, even if it is not quite 'idiot proof' yet.

Obviously with such a vast exhibition you will have to define your areas of interest. If electronic drums are your mainstay then you will want to visit the drum department with a map of exhibitor stands grasped firmly in your hand. Catering and other facilities at Frankfurt are wonderfully efficient and faultless, with a restaurant on each floor and several permanent snack bars and rest areas on every floor. Moving walkways take you from area to area and there is every facility you could wish for, including an inter-denominational chapel!

For the UK punter, the problem is that Frankfurt is not exactly next door. Standard air fares are outrageous – about £350 return and £120 if you book 7 days up front – and hotel prices are not cheap – around £70 per night per head. However it is possible to get around this by finding a hotel that books the room regardless of the number of people it has in it, and then picking a flight from one of the bucket shop offers.

On recent enquiries these work out at between £76 and £89 return which is a considerable saving. The catch is that you will have to fly from Gatwick and so you will need to add on the cost of getting to the airport and back. The Frankfurt Fair is on March 2–6 with the public days being Saturday March 2 and Sunday March 3. On top of all that you should add on the cost of eating (slightly higher than over here) and admission which is about £8 per day, £4 for students.

Are these fairs worth going to? If you are in anyway associated with the music or music software trade, the Frankfurt Fair is definitely worth a visit. There are products that demand a market in this country and you could be the person to capitalise on this. The London show is essential for any self-respecting computer musician or any one with an interest in making music.

More details on these fairs from: International Music Show (London) : Westland Associates 071-730 7852 and Frankfurt Music Messe: Collins and Endres: 071-734 0543.

MIDI Music Show

The MIDI Music Show on April 26-28 at the Novotel in Hammersmith brings you the perfect opportunity to see, hear, touch and use all of the products that you are now reading about.

The show, sponsored by *Making Music* magazine will have over 100 companies showing the latest keyboards, software and all other products.

The extensive seminar programmes, which are free of charge to all visitors to the show, will cover a range of subjects suitable for both the beginner and the expert. For more details contact Westminster Exhibitions on 081-547 1183.

HOW THE MICRO

As the micro has expanded in every conceivable way, the music facilities have also swelled. Essentially there are two ways to make a micro work musically. You can use the internal chip or you can get it to control an external sound generator like a synthesiser...

At first, the tunes and effects that computers generated were primitive to say the least. That is, until the rise of the specialist music programmer. Armed with his carefully guarded and usually self-written 'player program', the games music programmer was able to turn the internal chip on its head. This, then, is the basic way to make your micro musical: poke the internal chip until it bleats.

There are not that many internal sound chips around. The most common is a direct descendant from the first generation of arcade games. It is the AY 8912 or clone. This chip has seen the insides of many a computer: BBC, Amstrad CPC, IBM PC, Atari ST, Spectrum 128, MSX, Dragon. However for each of the aforementioned machines there are programs about that allow you, the user, to play around with its capabilities, including the three channels of sound, any of which could be chosen to generate noise. There were even bolt-on boxes containing this chip for the musically moronic Spectrum 48 with its woeful 'beep' command. More adequate was the Commodore 64 which had a specially designed SID chip. The sound was a little more varied with four channels to go at, and the filters – those devices that clean up the sound – were certainly more effective. Hence the games had much better soundtracks. The real breakthrough with the 64 came with the realisation that digitised sampled sound could be stored and played back through the chip.

The best computers around at present for making music internally are the Amiga and the Archimedes. Both these machines have specialist custom-designed music chips. The Amiga is more established in the market and its stereo sound chip is capable of playing back sampled sounds. A program that has a library of sounds to go at, and that is capable of using those sounds to create a tune will sound pretty good. The Amiga stores its sound in common formats that can be used by other Amiga programs. The specs for the Archimedes are even better. An eight channel internal chip, a similar ability to play back sampled sounds with good fidelity, but it can handle more sounds simultaneously. As yet

though there are few programs on the ground for the Archimedes.

If you decide to make the internal chip your first foray into music on your micro then here are a few points to bear in mind:

The heart of any music system is the sequencer which is to music what a word processor is to the office. It organises a series of notes in correct order and will repeat specified sections if asked nicely. It will also contain information relating to what sound is to be played, for how long, and even what effect should be applied to that particular note. If

we are using internal voices the sequencer tends to be of the step-time variety – you write the notes in one by one, sometimes graphically, sometimes using a string of commands. Sequencers that control external sound generators tend to be real-time ones – that is, they act like a recorder.

- Beware of programs that invite you to enter notes as a data string. This procedure can be frustrating as you will need to know exactly what notes you want beforehand. However most programs that create games music use this type of program, as they are very economical on memory space.

- Traditional notation is only good if you can read music. If crotchets and quavers mean nothing to you then look for programs that have a graphic score display – pretty patterns that display the notes as blobs on the screen. The bigger the blob and higher up the screen, the longer and higher the note.

- Make sure you can save the tunes and file them; you should ideally be able to store the tune completely and also sections of it separately.

- Ideally you should have some preset sounds and some way of easily being able to create your own without having to resort to difficult maths and data strings.

One of the chief weapons in the synthesist's armoury is the sampler: the device that does to sound what a video digitizer does to an image. Having sliced the sound up at a rate of up to 40,000 times a second, the sampler will let you edit any or all of the sound, reverse, loop

and generally stand it on its head. Both the Archimedes and Amiga can not only play back and manipulate samples with ease, but at the same time run sequencing software. Although there is sampling available for the ST and other micros, for the real serious business of sound creating you will need to purchase a separate dedicated sampling unit. Even the most basic dedicated sampler will set you back about £750; the popular Akai range of samplers starts at about £1450 plus. However a humbler start to sampling on your micro could set you back as little as £35.

Where sampling computers score heavily over their dedicated stand-alone counterparts is the visual display of the wave form. Having got our sample into the machine we need to manipulate in all sorts of ways;

- Sections need to be identified so that they can be either copied or cut and pasted elsewhere.

- There needs to be some way of throwing away unwanted garbage and "zooming" – magnifying – the wave forms left so that fine editing can be achieved.

- A choice of sampling rates should be on offer. You don't want to chew through unnecessary amounts of memory.

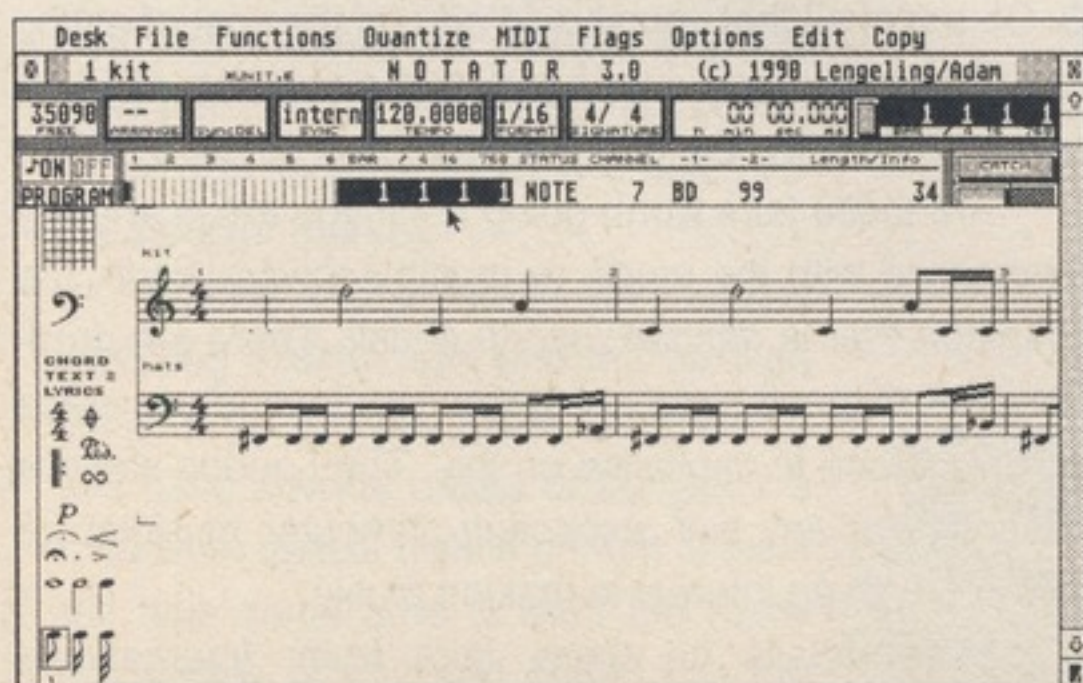
- It should be controllable via MIDI, preferably for more than one note at a time – if MIDI is not your raison d'être then check to see if the samples can be stored in a format that can be incorporated into a game or some utility. Endless fun can be had by substituting your own sound effects in games.

- It goes without saying that the sound samples should be able to be stored, and in the configurations that they were made.

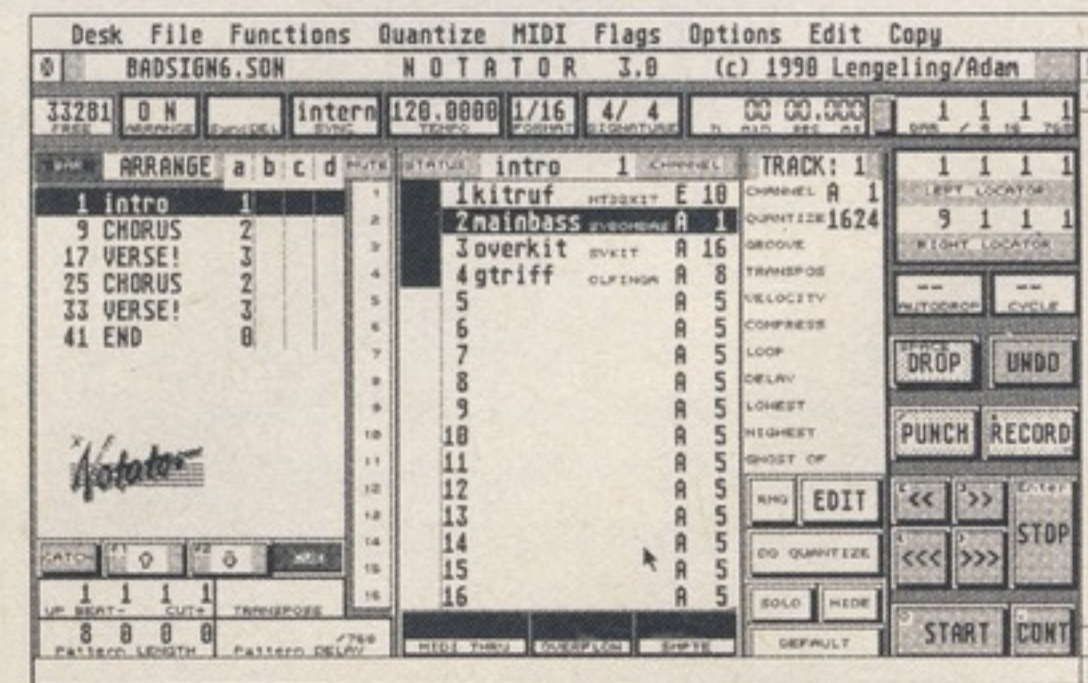
- Real looping is a must. 'Looping' is sampler jargonese for the multiple repetition of a section of the sound sampled.

USING EXTERNAL SOUNDS: MIDI

The second option is to utilise the processing power of the micro to organise music. Some years ago the major synthesiser manufacturers in the world got together with very much the same idea. They had progressed to the point where all their instrument communication systems, adding synth A to synth B, were contradicting one another and the all important sales figures were



● Notator on the Atari ST provides an interface which is clear and simple to an accomplished musician; other programs are not so friendly and require programming-type knowledge.



● The sequencer is the core program when it comes to computer music. Unfortunately they are necessarily complicated and tricky to use.

COMPUTERS MAKES MUSIC

descending rapidly. Thus it was that MIDI – Musical Digital Instrument Interface – was born. MIDI turned out to be a life-saver, and from about 1984 pretty well any instrument worth serious consideration has MIDI ports fitted.

In outline it allows notes and all other information related to performing on the instrument to be turned into a common code and transferred in real time to another instrument. Because digital information is being transferred, it is a logical step to put a computer in the chain as a storage device. And since a micro is best at dealing with data, why not leave the problem of sound generation to external sources and let the power of the micro manipulate and control them. The micro has been taking an increasingly important role in the creation of tunes and sounds and many of our beloved chart artists and production teams owe as much to their micros as they do to their sometimes dubious talent.

The two prime uses of a micro in the MIDI music chain are 1) acting as a sequencer – a device that stores and plays back performance data much in the manner of a tape recorder and 2) programming the synths themselves to create new sounds or put sounds into them acting as a sound library for the synth.

SEQUENCING

Without the sequencer there would be a considerable difference in the music produced and written today. There are dedicated stand-alone music sequencers but for our purposes we are talking about software that turns the computer into one. A typical sequencer acts very much in the manner of a cassette recorder. You can record, say, the chords to your piece; play it back and whilst hearing it record another instrument, a bass line, on a separate track. Because MIDI can distinguish between 16 channels of separate musical information it can dis-

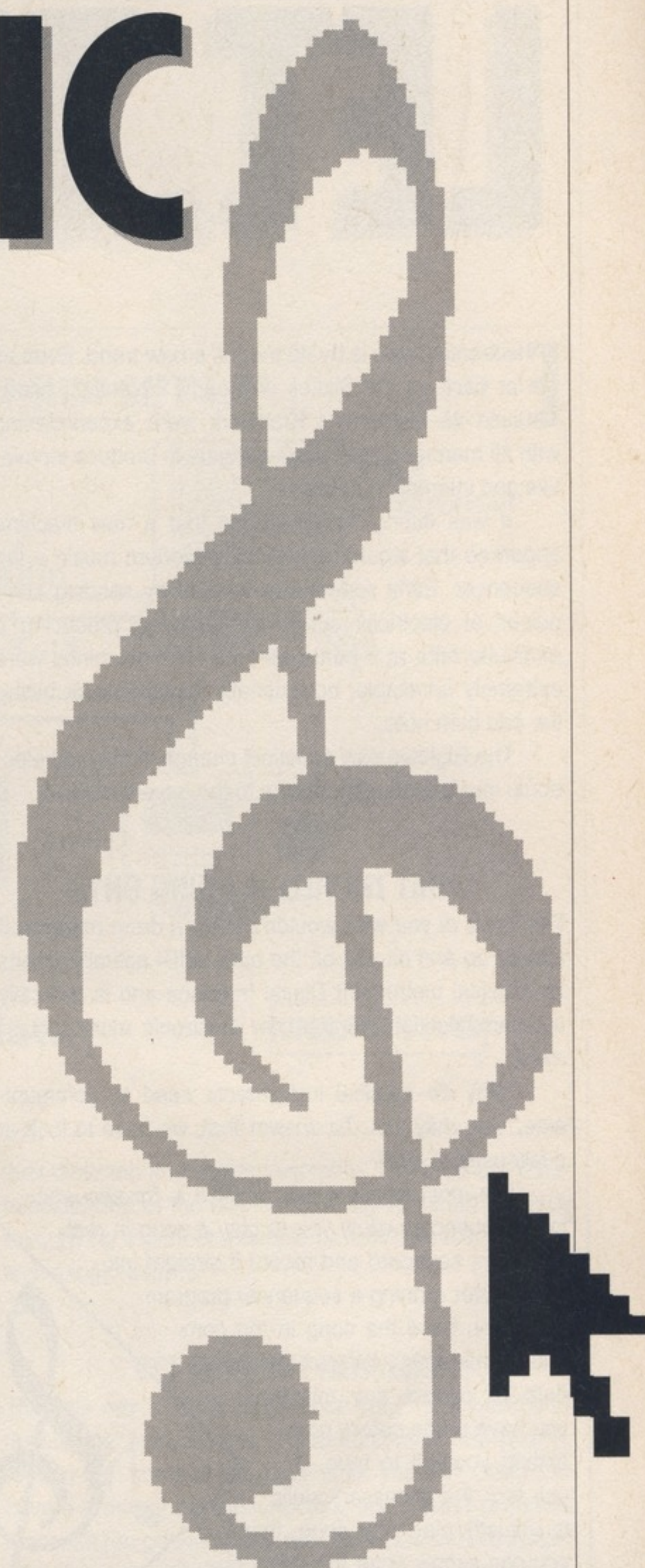
tinguish between the chords and the bass line which are assigned to separate channels, and, of course, separate synths which are to set to receive on the appropriate channels.

With any reasonable sequencer you can select any particular part, zoom in, and edit the blunders right out. This is done either numerically, graphically using some sort of grid and graph display, or in traditional music notation. Some programs boast all three methods. Most sequencers have a facility called 'quantise'. This will 'round up' the errors in the timing of the notes or drum beats to whatever tolerance you define.

The other great thing about sequencers is the ability to make up a small section like a drum pattern 'loop' or repeat however many number of times you like. In the best sequencing packages you can define whole sections of the tune and re-order them, put in gaps for new sections and even change the key whenever you like. Nearly all sequencers will let you copy data from one track to another and also mix and merge data from two tracks to a third.

Here we come to another advantage of the MIDI sequencer. When you copy or mix individual tracks on a tape recorder (known in the trade as 'track bouncing') there is a slight deterioration in quality because we are talking analog magnetic information here. But with a digital sequencer you can mix merge and copy until it comes out of your ears and it will still sound like the original. That's because you are asking the sequencer to actually play the instrument(s) itself.

By using the power of the micro to store, edit and control music you can use the technology as an extension of your ideas, not as a substitute for them. It doesn't require that much of an outlay especially if you bargain hunt through the classifieds and special offers, armed with a pretty good idea of what to look for. Enjoy.



SOUNDS

Making new ones, changing old ones

For a moderate fortune you can buy lots of sounds for individual synthesisers. These either come on cassette, or more usually RAM packs or cards. With suitable software though, you can create your own very easily. If you just imagine that any one sound usually requires about anywhere between 50 to 500 different peripherals being set, then work out that the LCD on most synths shows only a few 24 character lines, then you have some idea of the mental powers you need to keep all these figures in your head.

If you are like me you need the shape of the sound shown to you in jolly pictures.

CREATING SOUNDS

A Voicing Program will talk to your synthesiser on the Exclusive part of the MIDI code and graphically display the parts that go to make up the sound. By shuffling the various bits about you can create new sounds much more easily. What's more, most voicing programs have a library facility that catalogues your

sounds and lets you build up banks of sound that you can transfer in one go to your synth. Super smart programs of this ilk will actually go some way to helping you create sounds. Most programs of this sort only work with one model of synthesiser but there are also programs that act as universal programmers. The basic program is a shell into which you haul in templates that correspond to the way that the different synths create sounds. If you have enough memory, some of these will hang around in the background while you use the sequencer or whatever.

WHAT TO LOOK FOR IN A VOICING PROGRAM

- 1) It should be pretty obvious how it operates. In other words, try to avoid programs that give merely numerical lists. These are only one step up from the synth itself. Graphic display is the order of the day.
- 2) Any alteration you make to the sound is

updated on the display. Preferably you should be able to drag the display around.

3) All the main sound parameters are on one screen – it's no fun flipping between two or three screens to fix up a sound.

4) It should be able to store not only individual sounds but banks of sound as well; the whole sound memory of the synth. Look for the magic word 'librarian'. It goes without saying that it should be able to transfer either single voices or whole banks of voices and it should be easy to create and re-order the sound banks. If it is a program for a tone-module then the playing configurations should be easily alterable as well.

5) The sound you are creating should be playable from the QWERTY keys.

6) Any 'randomise' feature is a bonus; you can use it as a basis for computer-aided inspiration when messing about trying to create new sounds.

LET THE MICRO TA

Electronic music is by no means a new trend. Even as far back as the Sixties and early Seventies, bands such as Germany's Kraftwerk were experimenting with all manner of electronic gadgets to produce innovative and interesting sounds.

It was during the Seventies that a new machine appeared that would revolutionise modern music – the sequencer. Early sequencers worked by sending short pulses of electricity out to synthesisers, producing a particular note at a particular time. The machines were extremely unreliable, occasionally losing time or hitting the odd bum note.

The Eighties saw a distinct change in the way electronic music produced, thanks to the advent of MIDI.

WHAT THE HELL IS GOING ON?

For those of you who wouldn't know a drum machine if it leapt up and bit you on the bum, MIDI actually stands for Musical Instrument Digital Interface and is basically a communication standard for electronic music equipment.

"Why do musical instruments need to communicate," you may ask. To answer that, we have to look at a few uses of MIDI.

The most frequent use of MIDI is for sequencing. Sequencers allow you to play a song in real time on a keyboard and record it straight into a computer running a sequencer program. Once you have the song in the computer's memory, you can edit the data to correct any mistakes you have made before committing yourself to tape. If you lack the necessary skills to actually play your song, then you can simply enter the notes one at a time on the computer (known as Step Time Recording) to produce an entire song with every note played perfectly.

At the most basic level, you can use a MIDI keyboard and a sequencer program to create a simple song in your bedroom, giving a flawless performance time after time without going near a tape recorder.

However, MIDI is not only for producing a sequence of notes on a keyboard. These days, a wide range of MIDI programs and machines are available. It can also be used to control information passed to mixing desks and tape recorders. By simply setting up a pre-defined pattern, tape machines can be switched on and off and faders set at just the right point of a song.

These features are found on the more expensive pieces of equipment usually found in studios, but even on a fairly limited budget of around 500 or 600 pounds

Computer controlled music has over the past ten years been gradually filtering its way from the incredibly rich pop-star to the budding musician in their bedroom. The advent of MIDI and relatively cheap equipment may mean that electronic beats are now within everyone's grasp, but how does it all work. Maff Evans attempts to unravel some of the mysteries of MIDI.

you can set up a fairly impressive recording system using MIDI. All you need is a simple keyboard capable of receiving MIDI messages, a computer, a MIDI interface and a MIDI sequencing program (see figure one).

projects you can expand your set up to include a whole host of systems. From effects boxes and mixers to samplers and drum machines (see figure two), but this is where the technology starts to get more expensive.

No matter where you go, studios these days will always have an impressive range of music technology – all of which is linked together via MIDI. This not only results in a new style of music, it also saves time, since the artist can come to the studio simply armed with a couple of disks full of MIDI data, load them into the studio's machines and hey presto! The song's almost ready to record.

MIDI isn't just the property of the techno-boffin producer or keyboard player though. As the technology encompassed more and more equipment, other methods of controlling MIDI systems began to appear. These include electronic drum kits and even guitars and saxophones! This allows virtually any style of music to take advantage of MIDI from acid to classical!

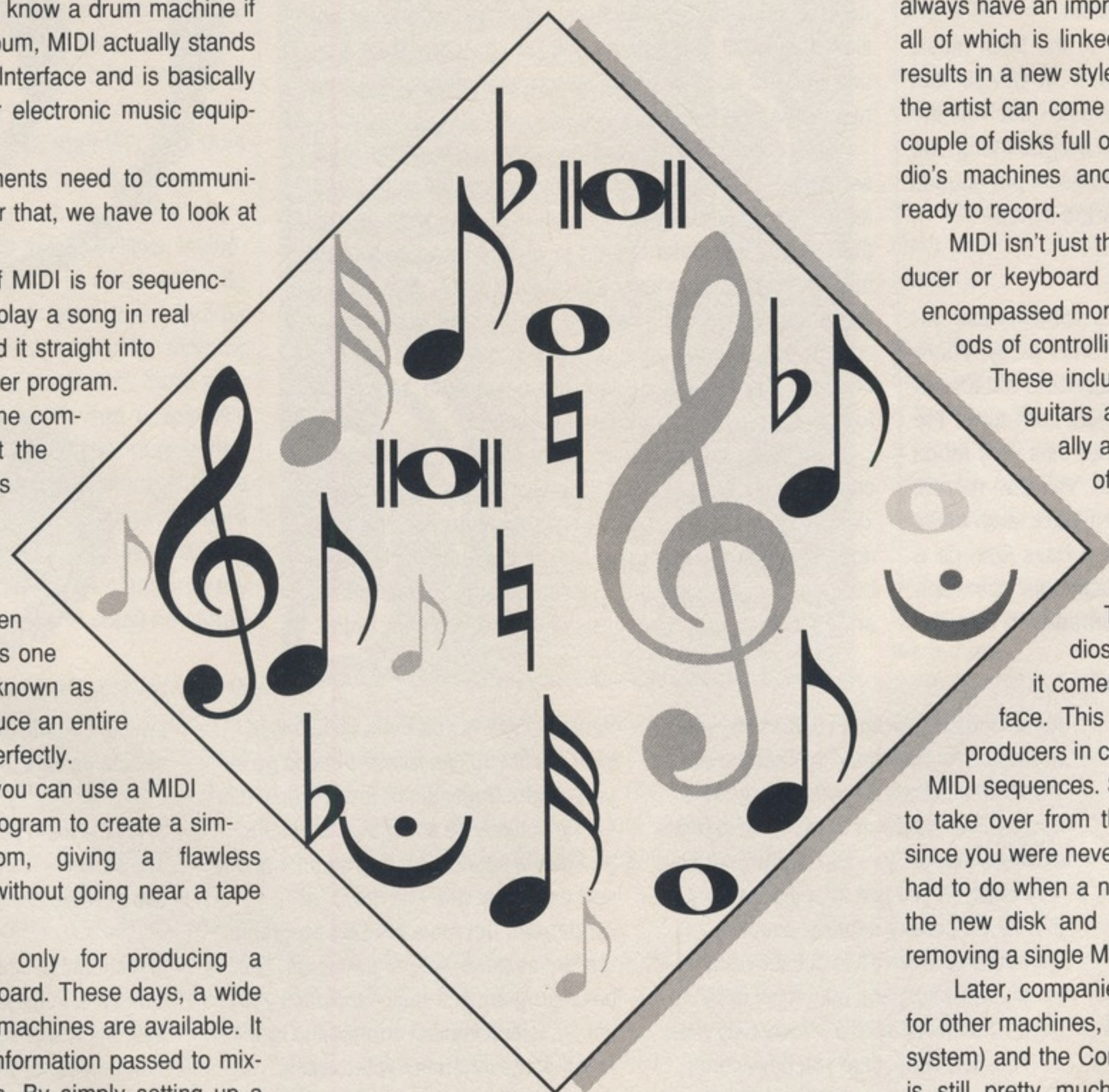
ALL TOOLED UP

The main computer favoured in studios is the Atari ST, due to the fact that it comes supplied with a built-in MIDI interface. This resulted in a number of software producers in creating a host of programs to create MIDI sequences. Soon enough Atari machines began to take over from the dedicated sequencer hardware, since you were never tied to a particular system. All you had to do when a new sequencer came out was insert the new disk and your set up was ready – without removing a single MIDI lead!

Later, companies began to release MIDI interfaces for other machines, such as the BBC Micro (the UMI 2B system) and the Commodore Amiga. Although the Atari is still pretty much the industry standard as far as sequencing goes, the Amiga is building up a strong following with the superb MIDI package *Music-X*.

Despite the competitiveness of the software market, sequencer programs still tend to be rather expensive. Steinberg's *Cubase* for the Atari is certainly an outstanding package, but a mite expensive at around £600! All those interested in producing music who's jaw has just hit the floor...DON'T WORRY! There are a number of alternatives.

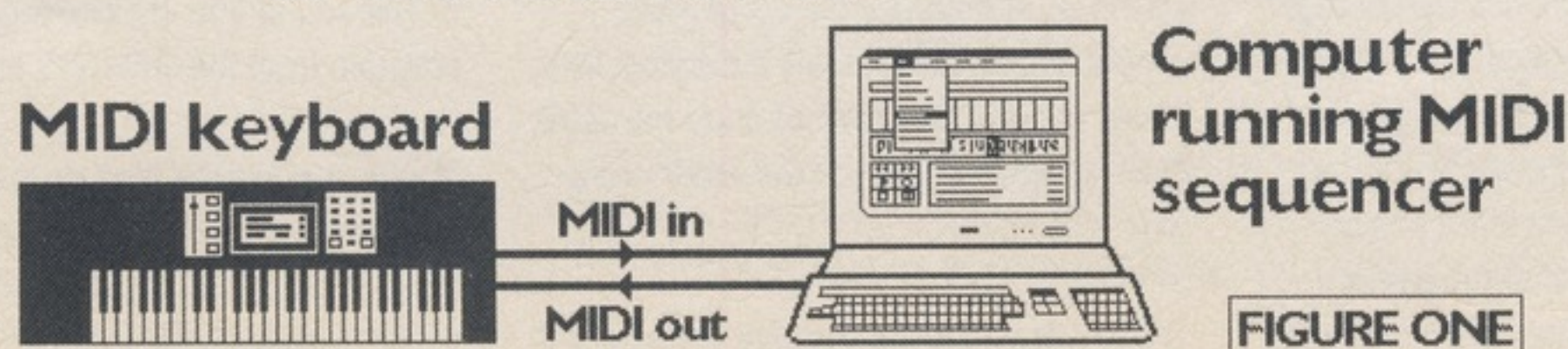
To begin with, a beginner's version of *Music-X* is available for under £80, and by hunting through PD libraries there are a few programs available for little more than the price of a disk!



LIFE IN THE BIG LEAGUE

When you're ready to progress on to more ambitious

BASIC MIDI SET-UP



TAKE CONTROL...

produce the basic drum pattern loops we all know to create soul and dance tracks, but there are also those who are experimenting with all manner of MIDI devices to create new and occasionally unusual music.

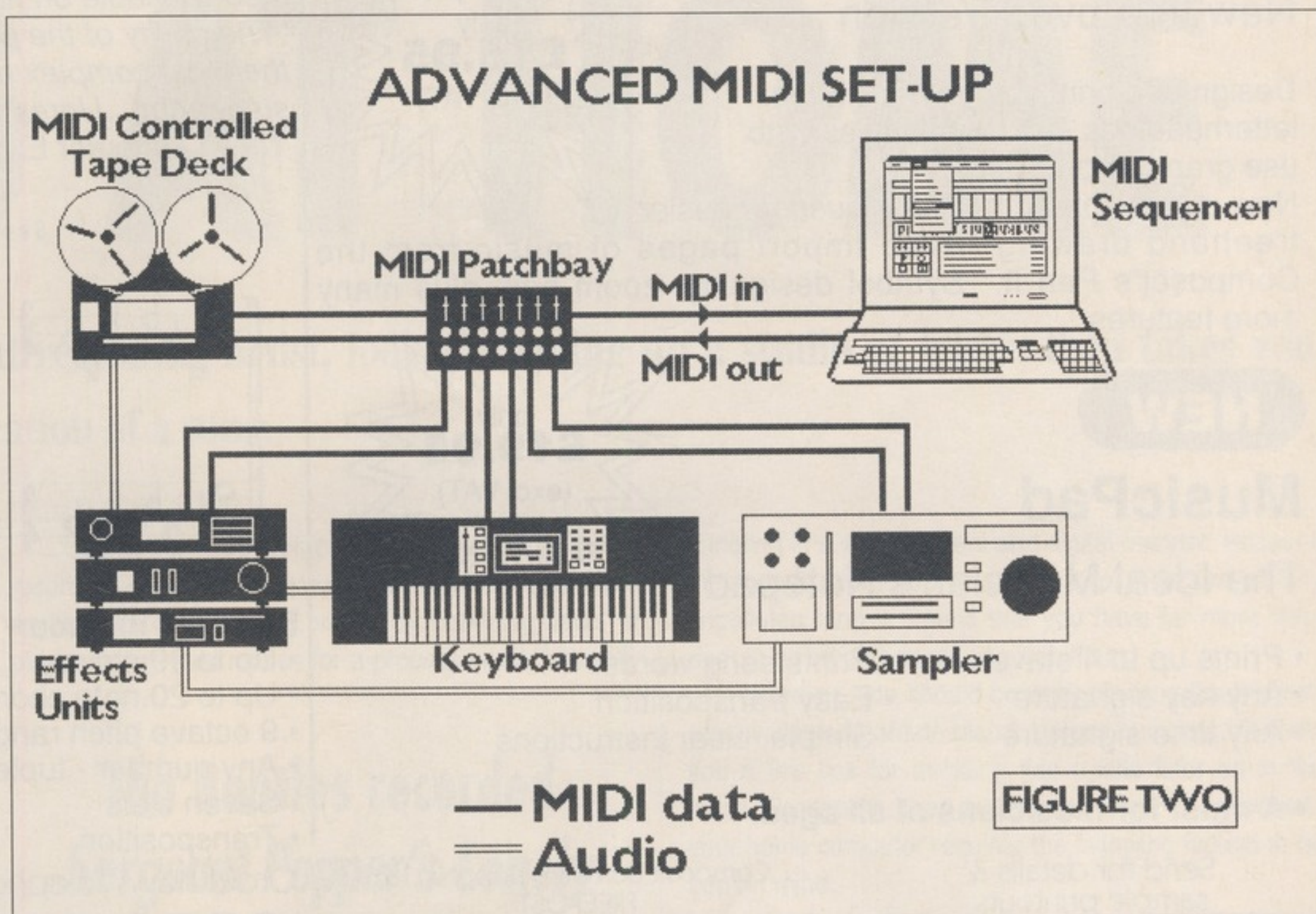
Black Box (of *Ride on Time* fame) use an Atari ST running C-Lab's *Notator* to create their hit tracks. The sequencer is linked up to sampling equipment, which they use to combine various sounds to use on the final song. Their particular brand of music is a perfect example of how MIDI and sequencing has revolutionised chart and dance music, making it quicker and easier to produce club rhythms.

MIDI is, more often than not, the producers tool. Another advocate of the Atari is Youth, former member of Killing Joke and man at the remix controls of a number of chart acts, including dance sensation Blue Pearl and Stourbridge's finest Pop Will Eat Itself. Youth combines samplers, keyboards and even old analogue gear to produce his eclectic beats.

On the outskirts of pop music are those who have taken MIDI and experimented with the technology to produce varied and original music. A prime example of this is Manchester indie-guitar band What? Noise. They use an Atari to generate powerful drum patterns and sample loops to back up their manic guitar work outs, producing an unusual blend of styles that works particularly well.

One of the most interesting current use of music technology is beginning to appear from Europe and the dancefloors of Chicago – once famed for bringing us House Music. The new dance style tipped to take British clubs by storm is a combination of hard-edged, metallic rhythms and pounding bass riffs backing up abrasive vocal samples from films and news-reports. Already a number of clubs specialising in this new industrial-dance have begun popping up, from Wolverhampton's Dreamhole to London's Headhunters and the highly popular Hard Club '92.

The major advocates of this powerful electronic music are Belgium's Front 242 and Canada's Skinny Puppy. 242 use state of the art MIDI technology, includ-



ing Cubase on the Atari and racks of Akai sampling equipment to assemble their eclectic collection of cut-up voices and harsh rhythms.

The new dance style tipped to take British clubs by storm is a combination of hard-edged, metallic rhythms and pounding bass riffs backing up abrasive vocal samples

Skinny Puppy take a more experimental view of musical technology, using sequencers to produce highly complicated and often overpowering rhythms to back

their distorted and warped samples. The results are the opposite end of the electronic music spectrum to Black Box, giving a perfect example of how versatile the new technology really is.

GET IN AT THE DEEP END

The only way to really experience the joys of MIDI is to actually get hold of some cheap equipment and playing around with some of the gadgets for yourself. Once you have a grasp of the basic techniques, it soon becomes immense fun pounding out drum patterns and keyboard riffs. Soon you could be experimenting with weird samples and rhythms like Skinny Puppy, or even producing a bigger dance smash than Black Box!

Get on the beat and have yourself some fun! ■

Plenty of potential for expansion

Once you've bought your MIDI keyboard and spent some time with it connected to your computer, you'll probably yearn for some more kit to help you realise MIDI's expansion capabilities. To avoid filling the room with keyboards, some clever person came up with the idea of the expander. This is a box that contains all of the electronics from a synth, sampler, piano, organ or other piece of MIDI kit but instead of having a full sized keyboard, it communicates with your existing keyboard via MIDI leads.

ORGAN GRINDING

The Elka/Orla flute expander is a small grey box with a set of controls that closely match the Tone Wheel Hammond Organ. For a few pence under £500 you get a drawbar organ with percussion,

presets, and the ability to take its control from two keyboards in the normal electronic organ way or from one if that's all that's available.

It's simple to build up a library of your favourite organ sounds and save them onto programmable presets. There are pre defined presets too so you can get straight to the three most common organ sounds at the push of a button.

The effect that gave the Tone Wheel organ its familiar rich sound was achieved by connecting it to a large and cumbersome speaker system enclosed in rotating baffles. This system known as a 'Leslie' after the company that pioneered it gave the sound a fast 'rolling' tibia effect or a slow 'chorale' effect.

The Elka/Orla expander contains electronic circuitry that faithfully

reproduces the 'Leslie' sound even down to the gradual build up of speed to the rolling tibias. The effect on the sound is to simultaneously change the frequency and amplitude by a small amount producing a rich tremolo with an underlying vibrato.

The expander has a magic chord feature that allows chords to be produced in the melody and although a purist might frown on such help, it offers the beginner a quick way to pleasant full sound.

ON THE RECORD

The Brother MIDI Recorder is a small expander box with a 3.5-inch disk drive and controls very similar to those on a standard domestic cassette recorder or CD player. Instead of baffling you with layers and levels of screens, it works in a

similar way to the tape recorder. The supplied disk has several demo songs on it and room for your own compositions too. If you're happy with one pass recording or you want somewhere to lay down a basic track to work from, this little gizmo is for you. You don't need a degree in Physics to use it, even our cat can understand the simple controls. It's a simple no nonsense no frills MIDI recorder that allows you to experiment with basic recording without having to set up a full blown studio. It won't break the bank either. At £250 it represents good value for your cash.

The Elka/Orla Flute Expander and the Brother MIDI recorder are both widely available from keyboard and musical instrument suppliers.

Composit Software

SketchPad II

New Improved Version

Design and print your own pictures, letterheadings, etc., with this easy to use graphics program.

Now compatible with AMX Mouse for easier freehand drawing. Also import pages of music from the Composer's Pen II. Symbol designing, zoom edit, plus many more features.

NEW

MusicPad

The Ideal Musician's Notepad

- Prints up to 4 staves
- Any key signature
- Any time signature
- Prints song words
- Easy transposition
- Simple, clear instructions

• **A must for musicians of all ages.**

Send for details & sample printouts or ask at your local music/computer shop

Composit Software Dept N/118
FREEPOST
10 Leasowe Green, Lightmoor,
Telford, Shropshire TF4 3BR

only
£15.95
(excl VAT)

only
£19.95
(excl VAT)

Soon
available
on PC!

The Composer's Pen II

Also available on IBM PC compatibles, ring for details.

"The ability of the program to handle even the most complex musical layouts is staggering...Unreservedly recommended."
New Computer Express.

only
£74.75
(excl VAT)



Features include:

- Up to 99 staves
- Up to 20 note chords
- 9 octave pitch range
- Any number - triplets
- Seven clefs
- Transposition
- Comprehensive beaming and flagging
- Full control of note and staff spacing
- Text and standard music symbols
- 'Cut and paste' music
- Print the score and the parts
- Clear manual written by a musician

Order now! Telephone hotline

0952 595436

Cheques payable to Composit Software



ATARI ST ★ ATARI ST ★ ATARI ST ★ ATARI ST ★ ATARI

A brilliant offer for readers of New Computer Express!

Devpac ST 2

FROM HISOFT ONLY £44.95

Devpac ST Version 2 is widely regarded as the most powerful assembly language development system for the Atari ST. It incorporates a debugger, stand-alone assembler and a fast linker

IT INCLUDES:

- **GenST** Assembler is a high-performance, full-featured, two-pass Motorola standard macro assembler at up to 75,000 lines per minute. It has multiple modules and sections, repeat loops and macro calls that maybe nested as deeply as memory allows.
- **MonST** Debugger is an advanced symbolic monitor, debugger and disassembler. Now in addition it can offer Multiple window display, full expression evaluator, up to 22 significant characters in symbols, viewing of source files and conditional breakpoints.
- **Example Files** of a wide variety including a full GEM type windowing application and an example desk accessory.

The package comes complete with an extensive ring-bound manual plus notes on the various operating system levels and debugging strategies.

Order now by phone from the NCE mail order service or send the coupon to our FREEPOST address.

HOTLINE NUMBER 0458 74011

DevpacST 2
version 2

**Complete Assembler/Debugger System
for the Atari ST Computers**

**SAVE
£15**

Yes, I would like to order a copy of Devpac ST 2

Name

Address

Tel No

**I would like to pay by Access Visa
Cheque PO**

Please debit my credit card

No

Expiry Date

Tel. No

**Send & make cheques payable to
Future Publishing, FREEPOST, The Old
Barn, SOMERTON, Somerset. TA11 7BR**

RECORDING A SONG AT HOME

Jon Bates, a seasoned performer and recording artist, looks at setting up a studio at home, then takes you through the stages involved in the creation of a song.

The entire point on of this entire guide is obviously to produce a piece of music which you can then use to lead you into a world of fame and fortune – or at least play it to your friends.

Back in the old days of picking up a guitar and slamming out a few chords, the nearest most of us could get to 'music recording' was to sit an old tape recorder on the desk and hope that some of the sounds were picked up by it without all the background noise being included. The nearest we could have got to music production was to turn the tone control.

It has long been a part of the musos' book of myths that The Beatles recorded *Sergeant Pepper's Lonely Hearts Club Band* on two linked 4-track tape recorders – whether this is true is another matter entirely and one can only presume what George Martin would have given for an ST1040 running some of today's music software.

FUZZY LOGIC

Since then, however, the four track tape recorder – such as the Portastudio or plasticky Vesta Fire to name a very few – came onto the market and allowed anyone who wanted to, to record some more complicated overdubs. Even these, however, soon ended up as rather fuzzy sounding pieces rather than the pure masterpieces we had chasing around in our heads when playing the original.

One of the basic problems which this form of home recording is the fact that you are stuck with 4-tracks and any attempt at expanding on this by 'bouncing down' or 'ping-ponging' (two names for a process which basically

**The Beatles recorded
*Sergeant Pepper's Lonely
Hearts Club Band* on two
4-track tape recorders...
one can only presume what
George Martin would have
given for an ST**

means recording two or more separate tracks from different channels onto one empty track) inevitably ended in fuzziness and loss of top end. It was all so analogue.

The computer obviously does not have the problems of background noise because it treats its sound

handling in a very different and digital manner. Because the sounds which you create are kept in a pure, aurally unpolluted form it means that you have far more freedom to go on and on playing with them.

However, you should be wary of using the technology available to create bland, lifeless numbers, I'll show you a few tips for avoiding this a little later on in the piece. Essentially, then producing a piece of music with your home computer requires the following factors to be born in mind:

- **Planning:** it is always a good idea to have the basic feel for the piece which you wish to work on before you go marching into it with all instruments blaring.

- **Patience:** don't for one minute think that just because you have the technology at your disposal which has the potential to create perfect sounds that it will do this straight off.

- **Imagination:** That's the magic element

Finally, bear in mind the following which you can never have enough of in a decent home set-up: leads, get these from most good music stores. Batteries, if you're using effects pedals or MIDI instruments these are a must, lots and lots of good strong coffee – you'll only get carried away and need to perfect that drum. ►

WHAT DO YOU NEED TO SET UP AT HOME

Most people with an interest in the recording and production end of the music market can only dream about setting up in a spacious studio. We look at such cathedrals of sound as Abbey Road or Air Studios in awe. We know that the only reason they are able to get that rich, ballsy drum sound is that the room it was recorded in was huge.

There is no need to despair though. Armed with a computer and some decent software it's amazing what you can cram into 6-feet by 8-feet with a little thought. But where to start?

The most important item(s) you will need is a decent set of speakers. You can improve even the most modest sound system by shopping for a large and decent set of speakers. The reason for placing this at the top of the to get list is that, no matter how good your software, nor even that you might have a few thousands of pounds worth of Stradivarius lying about the place, none of it will be any good if you can't hear properly what you are trying to do. There are many

names of dedicated speaker manufactureres to conjure with, but look out especially for the following: Kef, Celestion, Wharfedale, Tannoy. In a sociable world of course, or if you have to work late at night, then the same would apply to a decent set of headphones.

For amplification, a medium to high quality domestic hi-fi amp will do, provided that it can take an 'aux' input. This would be much better than a guitar amplifier which can be quite noisy when you get up close.

GETTING IT TAPED

The next item on the shopping list is something on which to preserve your efforts, you should go for a decent cassette recorder, and if distributing copies of your efforts is one of your goals, then a twin cassette deck is preferable.

If you have several instruments all of which you intend to have running together then you will need some sort of sound mixer. Nothing too ambitious or

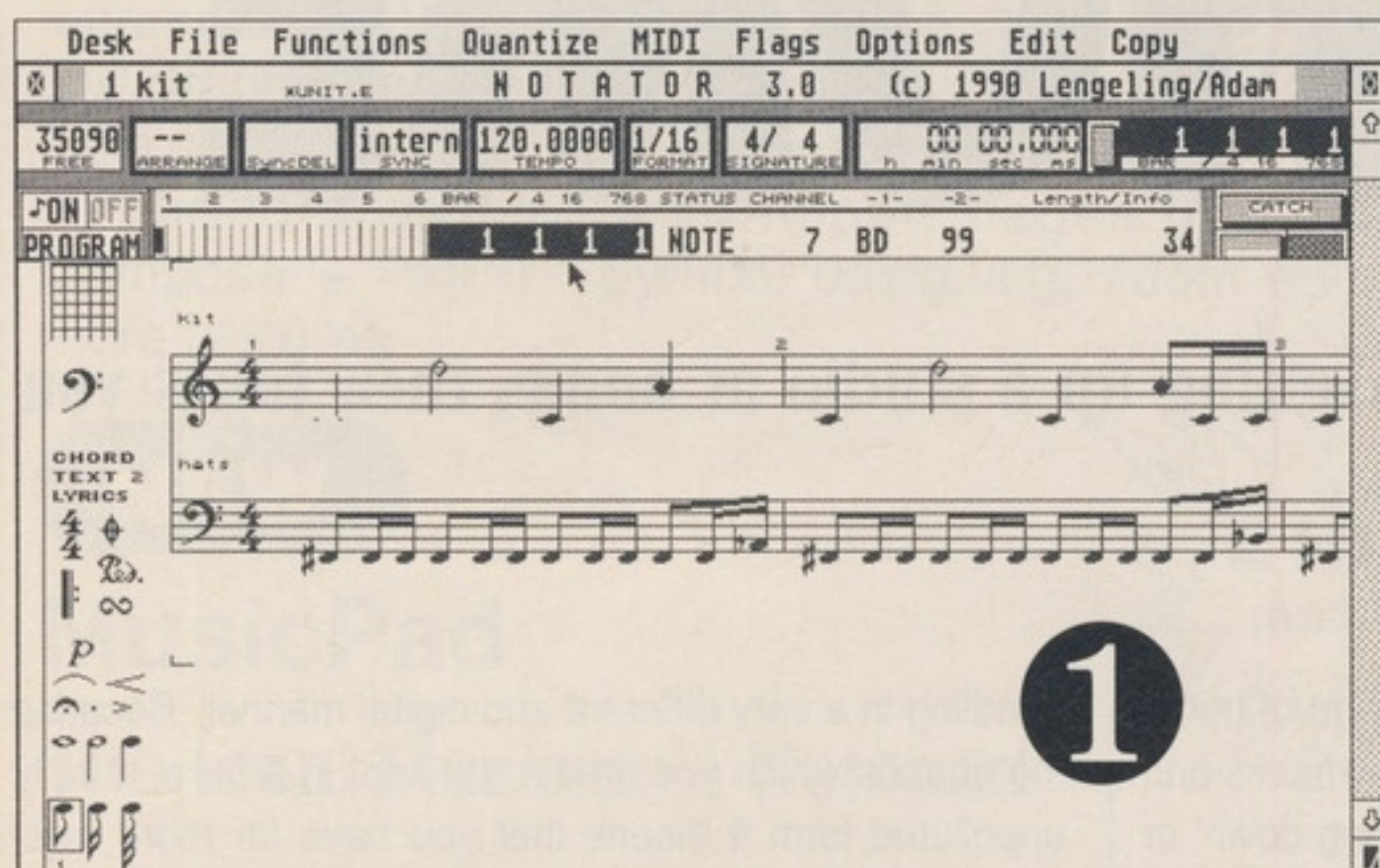
over the top: a flick through a few brochures will give you a rough idea but the cheaper end of the market tend to add lots of noise. You can combine the mixer and recorder if you wish by purchasing one of the many multi-track cassette recorders.

A trip to your local branch of Tandy will also be worthwhile, even if you don't like to look of the mixers you might turn up a bargain on the microphone front or even track down a reverb unit which can be tweaked to produce some unusual effects.

Although Amstrad do have a unit on the market that professes to do all that I have mentioned above, it is inherently noisy and worse still the noise will stay with you – there is simply no way of getting rid of it – in other words it has no Dolby or DBX noise reduction systems, which are essential in any home recording system. Finally, you will need a micro, maybe a MIDI interface and of course a instrument or two. You'll find the features in the rest of this supplement have more details on those.

RECORDING THE SONG

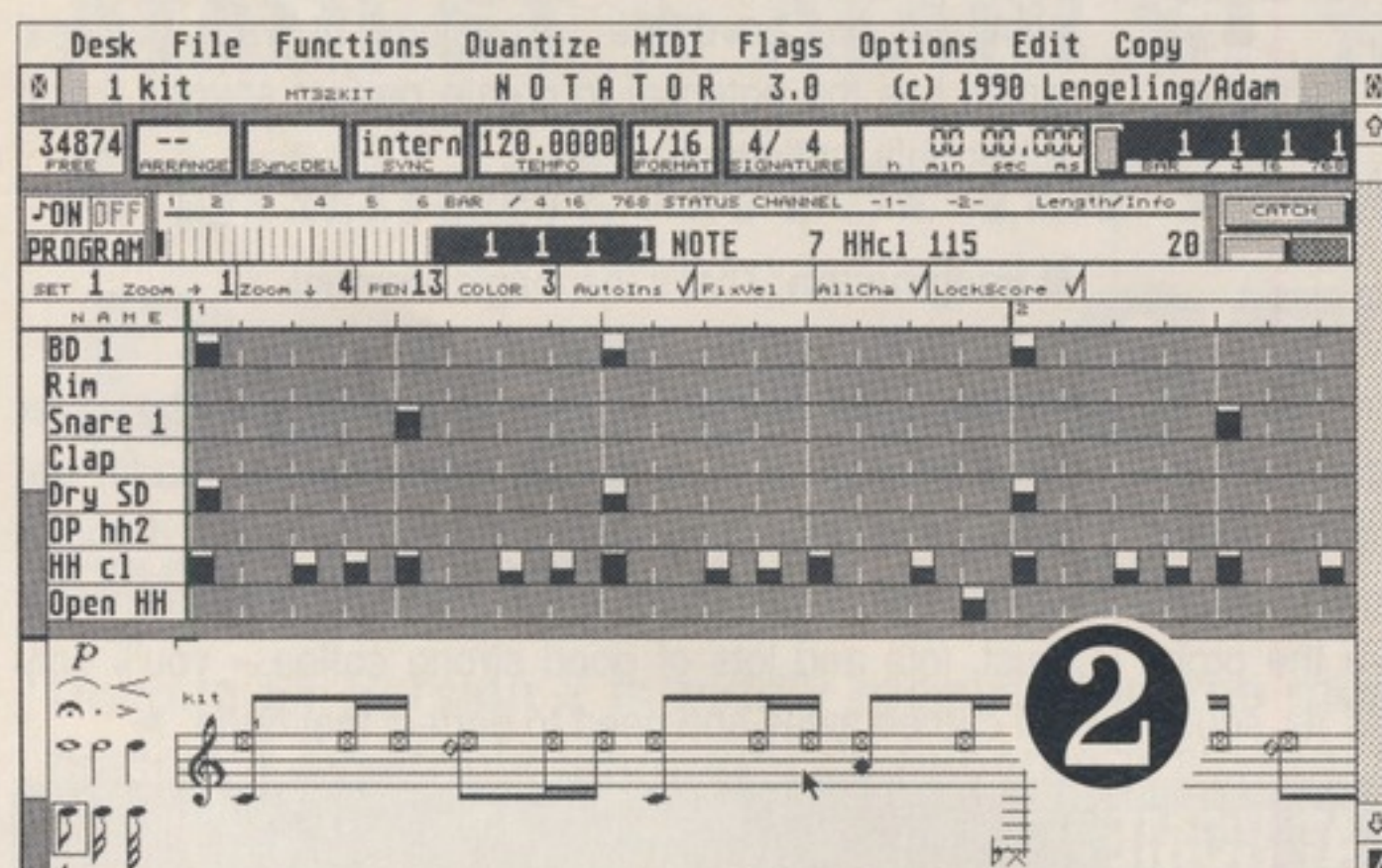
What follows is a walk through of a typical piece and how it might be built up on a computer sequencer. I've used quite an upmarket program, C-Lab's *Notator 3.0*, for the demonstration just to show off one or two features but the piece could have been done in much the same manner on any sequencer. If it smacks a little of painting by numbers then it might be as well to bear in mind that nearly all music of whatever type and ethnic origin follows a pattern and form. The measure of creativity is how fresh and new you can make it feel;



expanding, exploring and bending the basic outline.

I picked an old blues number *Born under a Bad Sign* and despite it having been released by Bart Simpson recently(!), it's having a Janet Jackson treatment: heavy repeated riff with tight snappy drums.

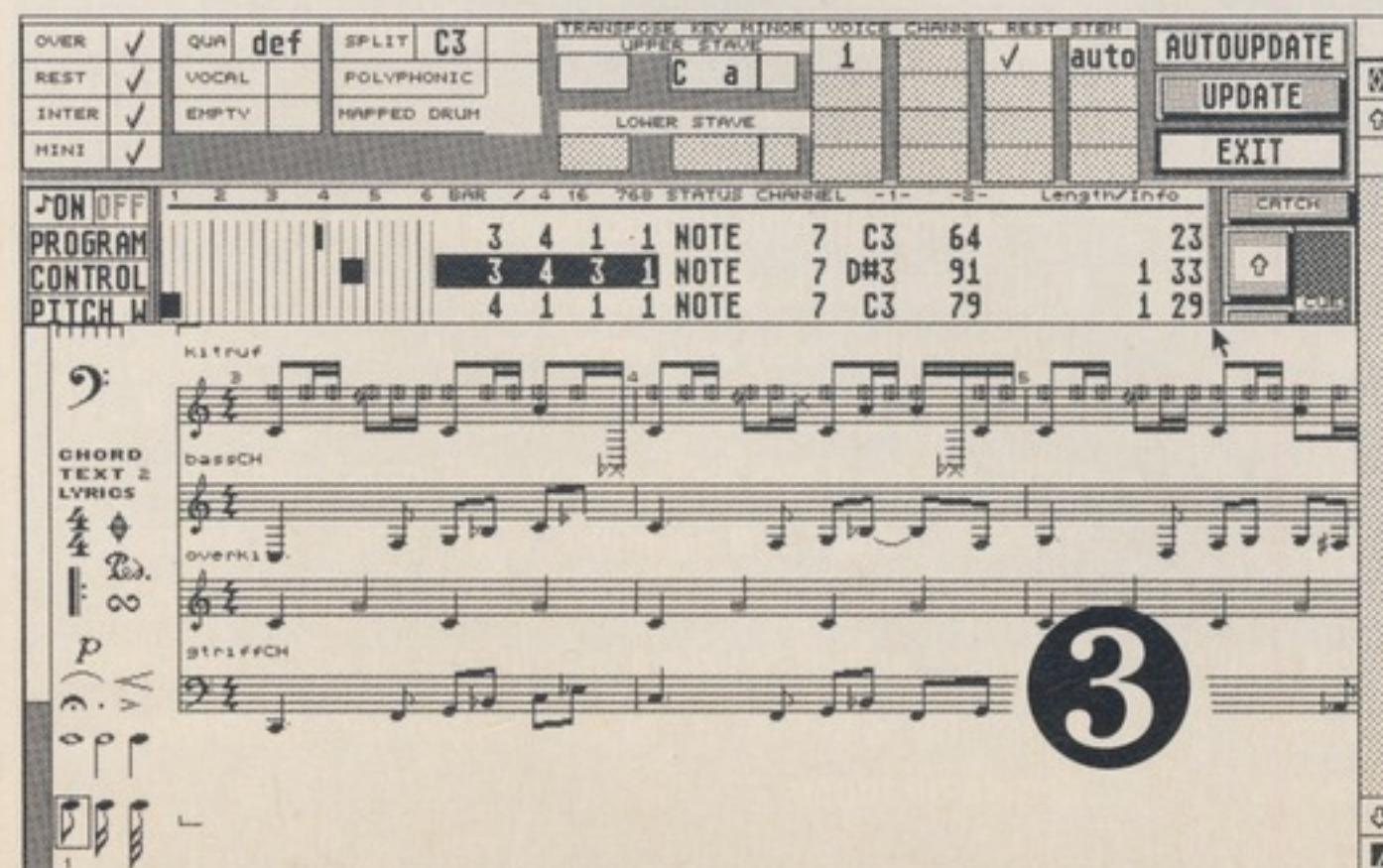
The sounds are coming from a Yamaha SY77 set on channels A1-16 and a Roland MT32 tone module set on channels E1-16. This is purely because my own set-up makes use of a several 'rings' of MIDI channels; the concept is that you have more than one MIDI out port from the micro and each port runs 16 channels of MIDI independently, hence the prefix letters.



BEGINNING THE BEGUINE

To start off, decide the basic drum pattern for the song. This may be altered as the song progresses but it will start the ball rolling.

Screenshot 1 shows eight bars worth of pattern which is all I really need to work on for the moment. First I add the basic drum kit which consists of a snare



and kick drum, then we put a hi-hat rhythm on top.

The drums are from the Casio MT32 keyboard. I have used a basic quantise technique in order to round up my errors to the nearest 16th note (semi-quaver).

Many programs have a 'capture strength' that decides just how efficient the quantise will be. The greater the efficiency of the quantise, the more accurate but anaesthetised the result will be. Quantise 16/24 leaves a slight margin of error in the notes which hopefully succeeds in giving the whole thing 'feel' rather than producing that all too familiar perfect computer sound which normally ends up by sounding like Muzak.

GOING HYPER

So that I can edit them in *Hyper Edit*, thereby giving me access to each drum to draw in slight variations, I've mixed them onto one track; see 2.

The tune has one main riff that is subject to slight variations for the chorus and verse. Having got the main

drums sounding approximately as you want them, the next task is to get this riff down. Some time is spent finding a good solid sound for it as it is the foundation and hook for the whole number; settling on a BombBass sound on the SY which has plenty of guts and fills out the bottom end nicely. Several goes are necessary to get the right feel and the best take stays in the memory – altering velocity settings for a note here and there if it felt too hard or weak.

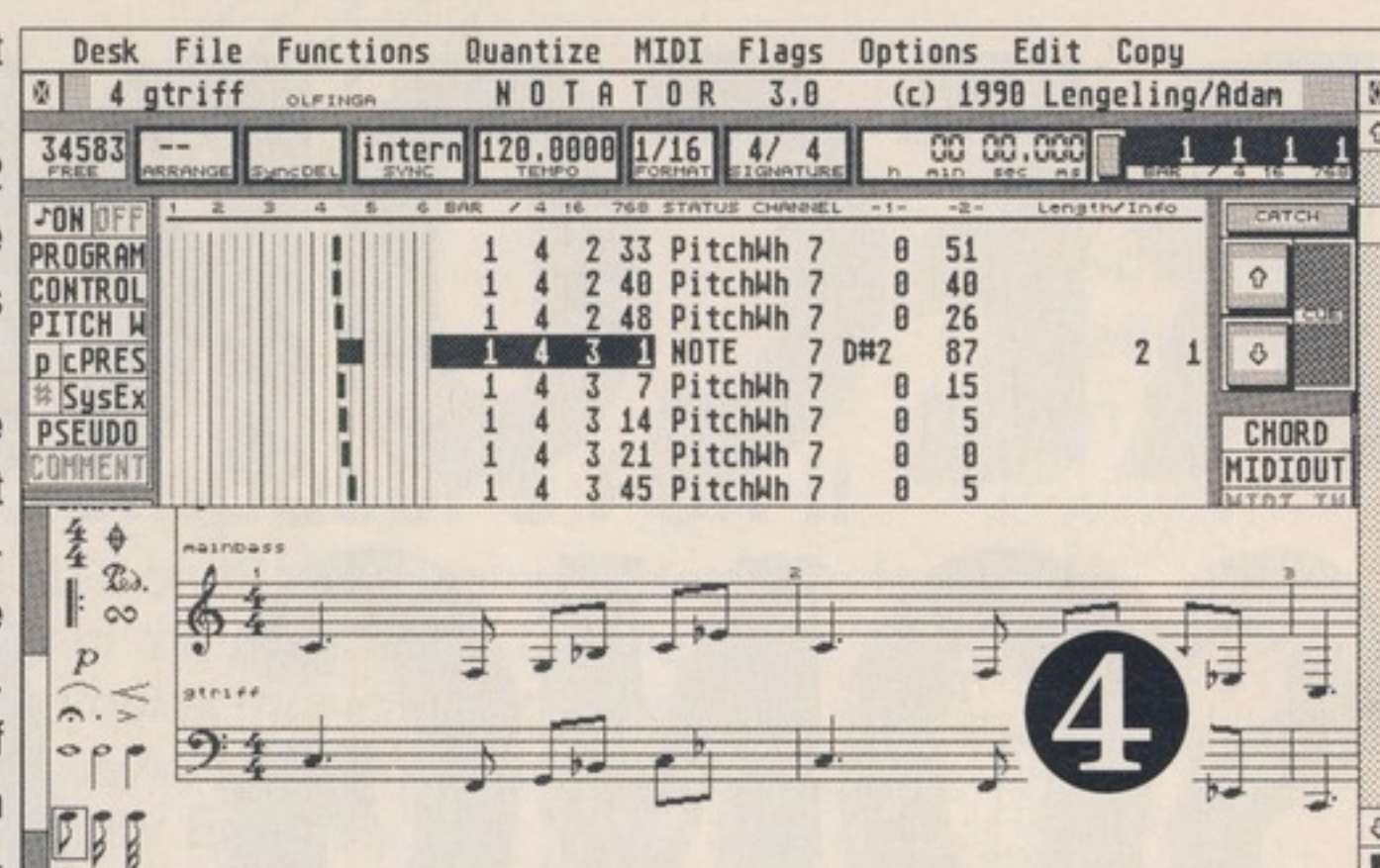
3 is the result, this time in music notation with the data stream of notes in the upper half of the screen. I also added extra kick and snare drums from the SY to make the rhythm track really jump. The final balance of the two kits can be adjusted later, either by using MIDI volume controls, the volume controls on the instruments or by balancing them on the mixing desk itself.

The bass needs doubling for some sections so I overdub a guitar sound playing the same as the bass. However since I

want to use pitch bend I haven't merely copied the bass part onto another track and changed the channel and sound; it's often better to redo the part again to get a live feel. 4 is the result of this.

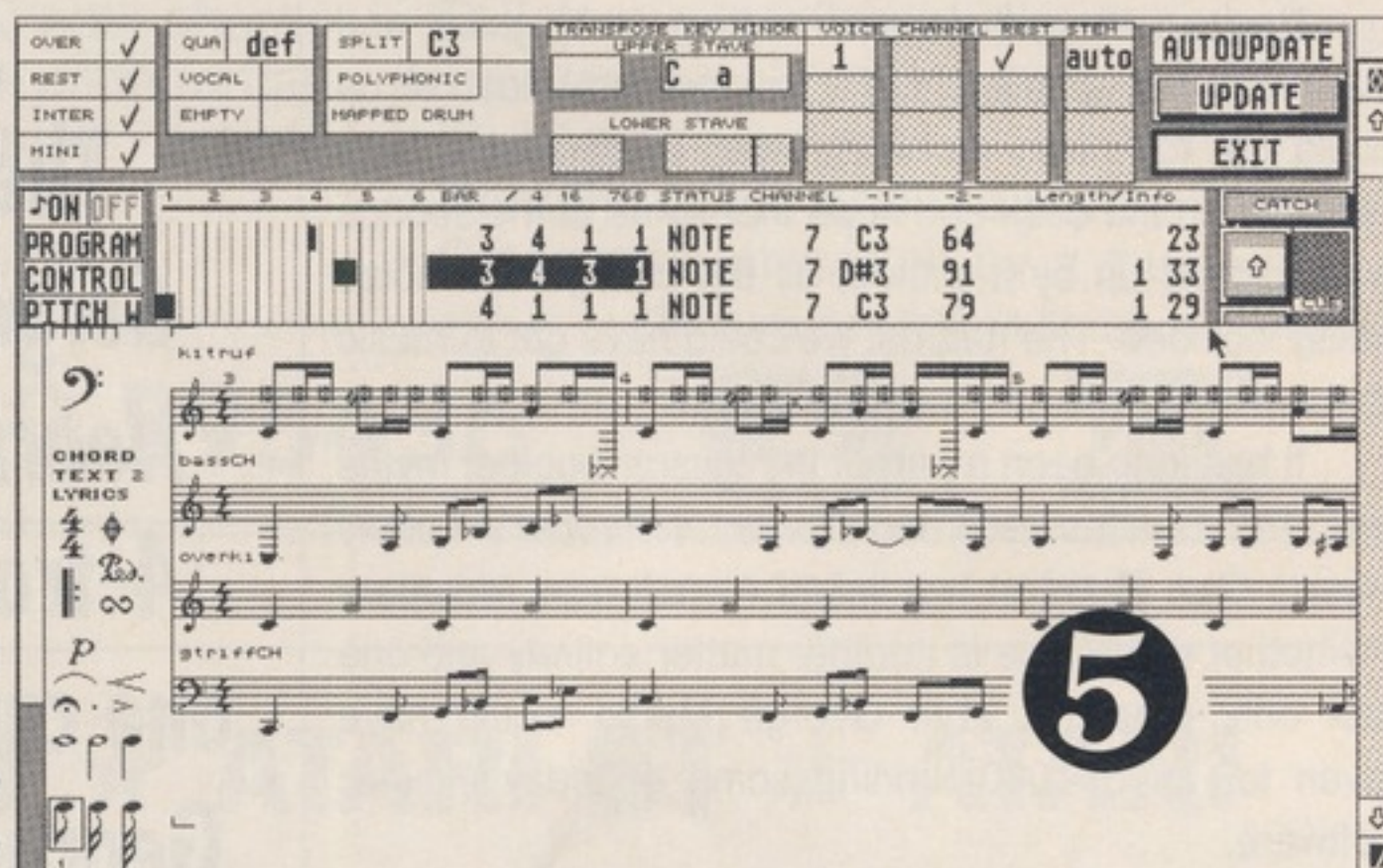
We still have only worked on eight bars but it forms the intro and master track for the song. Having saved it to disk, the whole pattern is copied to a new pattern, the bass and guitar discarded leaving the drum track. On top of this is put the slight variation to the main riff that constitutes the chorus of the song. OK. I could have gone through the parts on the edit page and changed them note by note but it could become too mechanical. The drums are still the same, shown in figure 5.

The verse is created by the



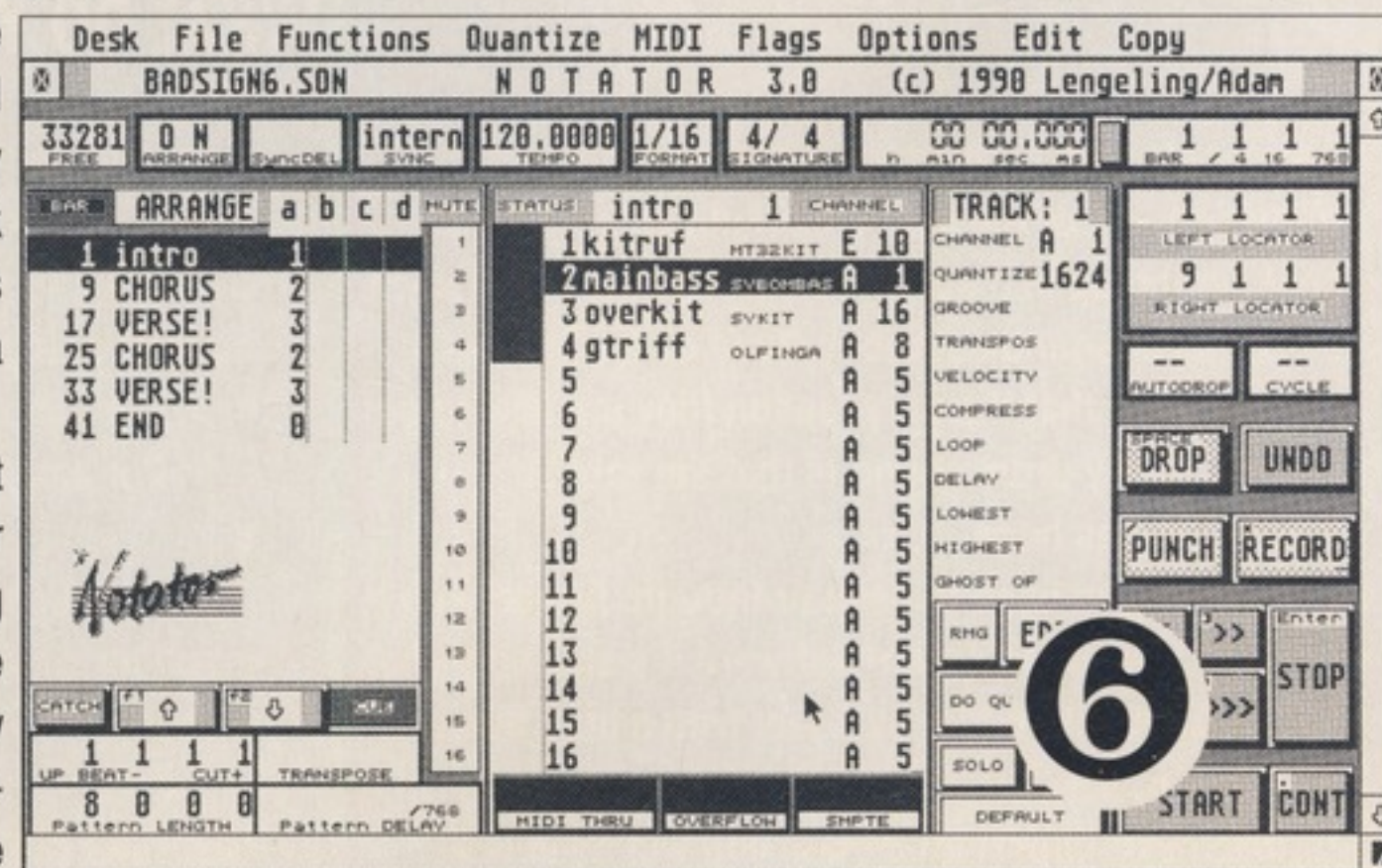
same process and then I piece the intro, chorus and verse together by using the Arrange section on the left hand side of the screen, 6. This is often called Song Chain or similar in many programs and each re-appearance of the patterns can usually have some modifications like transposition (changing the key) or an instrument not playing that time round.

This then is the first thumbnail sketch of the piece. It has a long way to go before we have a final product and a great many decisions have to be made along the way: key changes maybe, drum pattern alterations for different sections, some sort of ending and so on and so



forth. It may well be that I drop the whole lot onto a cassette and go in search of a vocalist. I would do this at this stage so that unforeseen problems of key, timing and feel can be corrected at this stage rather than later on when it would be a difficult task.

Adding acoustic instruments like voice, guitar, etc can be done in several ways. The most obvious is to record it at the same time as you record the finished backing track from the synth modules to tape but it does mean that it has to be absolutely spot-on. Maybe a



multi-track cassette would give a little more flexibility. The next step in sophistication is to use SMPTE or MIDI Time Code – to 'lock' the sequencer to a time code recorded on one track of the multi track machine.

The ultra smart method is to use the digital direct to hard disk recording system integrated with a MIDI recorder, a technique which is described elsewhere in this supplement.

TCB TRACKER



"MUSIC SOFTWARE OF THE YEAR" STF

ST VERSION
ONLY

£24.99

An Instant
ST Classic
NCE

Finest 4
Track Sample
Player STF

mph
COMPUTER
SPECIALISTS
LIMITED

10 Chandlers Court, Eaton,
Norwich, NR4 6EY

Telephone:
0603 503382



HAVING TROUBLE FINDING

NEW COMPUTER EXPRESS ?

First, if your local newsagent doesn't have a copy of Express on the shelf, try asking why not: sometimes even if they've sold out they'll have more copies in the storeroom or can order extras from their wholesaler.

Better though, if you don't want to subscribe, fill in the form below and hand it to your newsagent. (A photocopy or the same information on a piece of paper is equally acceptable.) Remember, every single newsagent in the country - from WH Smith to the corner shop - will be delighted to reserve you a copy each week. Or why not ask to have it delivered to your home?

Finally, if you still have no luck even with a big newsagent, call Kate Hodges on 0225 442244 and tell her which magazine you're after and where you've tried.

Complete this form and hand it to your newsagent

Please reserve me a copy of *New Computer Express* every week, beginning with the next issue, out on Thursday.

Name

Address

Phone number

To the newsagent: *New Computer Express* is published by Future Publishing and is available from your local whole-

Great New Year Offers!

Roland

FOR YOUR
MUSICAL MIDI
REQUIREMENTS

CM32LA, CM32PCM, CM64,
PC200, CN20, CP40, CF10.

Now all in stock.

Try the Yamaha PSS590
keyboard at only
£149.99

Bell Music 0795
3 Roman Square 425931
Sittingbourne

The incredible EVSI Expander at
only £299.99

For all your home
computer software.

If it's not in stock we will get it!

TRY US FIRST!

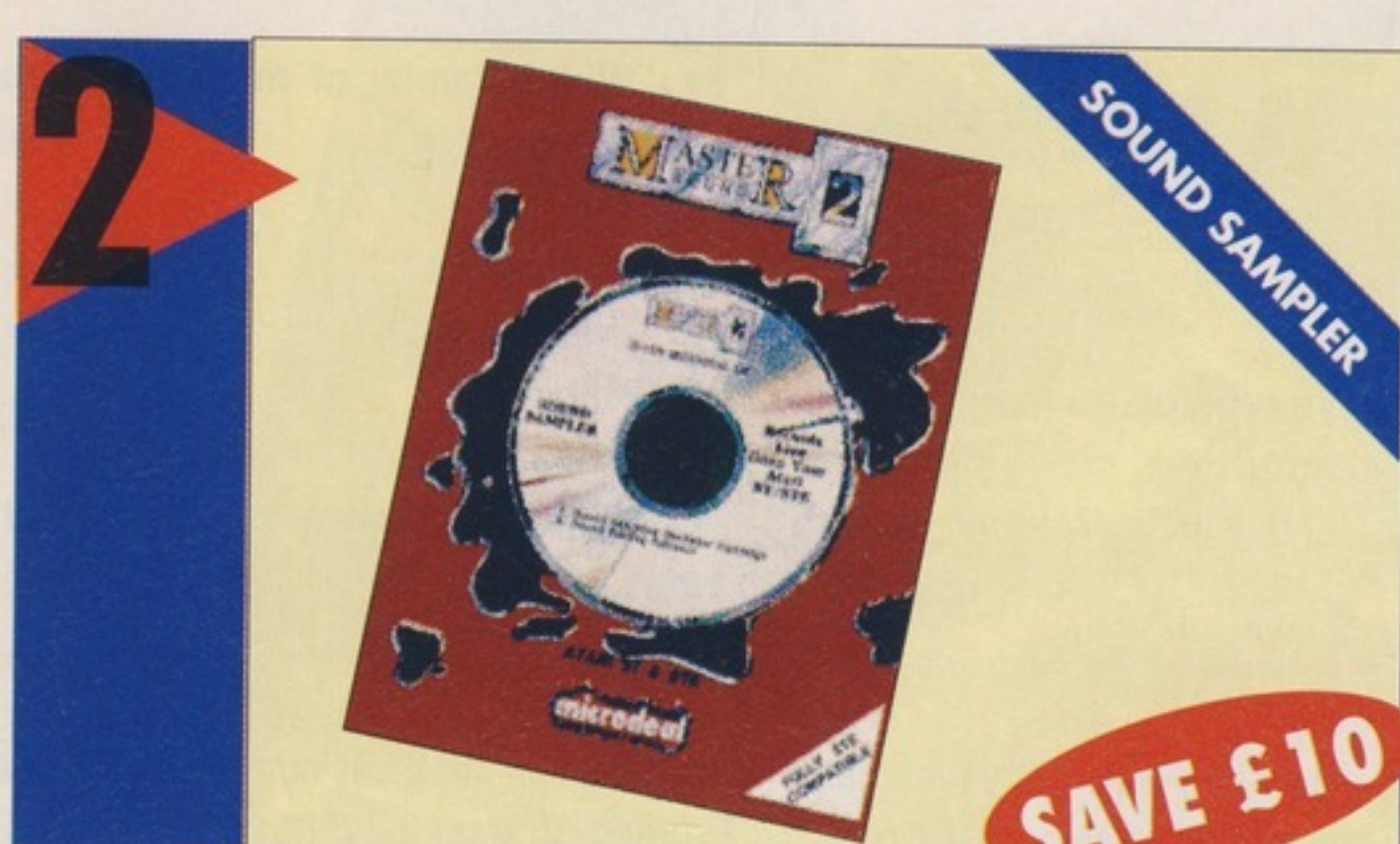
MUSIC PACKAGES FOR YOUR ST AND AMIGA



1 Quartet MICRODEAL

£37.95

A pattern-based music editor that uses on-board samples and has a variety of sample rates to give good quality record and playback. The newly updated ST version includes stereo output for STE owners.



2 Mastersound MICRODEAL

£29.95

A low cost, high quality sound sampler with comprehensive software. It allows you to store up to 30KHz of samples which can then be edited and treated with a variety of effects such as looping, filtering and magnification.

NEW COMPUTER EXPRESS
MAIL ORDER

NEW COMPUTER EXPRESS MAIL ORDER

Name

Address

Postcode

Telephone

Method of payment (please tick) ☐ Access ☐ VISA ☐ Cheque ☐ PO ☐

Credit Card No.

Expiry Date

Please make all cheques payable in pounds sterling to:
Future publishing Limited.

Description	Price	Order No.
Amiga Quartet	£37.95	NC001 <input type="checkbox"/>
Amiga Mastersound	£29.95	NC002 <input type="checkbox"/>
ST Quartet	£37.95	NC003 <input type="checkbox"/>
ST Mastersound	£29.95	NC004 <input type="checkbox"/>
TOTAL ORDER		

● Please tick
the box of your
software choice

● For overseas
orders call
Trevor for prices
on 0458 74011

SEND THIS FORM TO:
Trevor Witt, NEW COMPUTER EXPRESS
The Old Barn, Freepost, Somerton, Somerset, TA11 7BR

WIN! A £3000 KEYBOARD

The Cheetah Master Series 5V is a well loved instrument among computer musicians. Even our dear technical editor Keith Pomfret, who has been known to bang out the odd fuge while rewiring an MSX, owns one and he rates it as "Gradely".

Along with Cheetah we are offering this much desired keyboard at the knock down price of 22p (the cost of a stamp) to one of our lucky readers. All you have to is answer 10 unbelievably easy questions, fill in the form below and send it in to Music Competition, *New Computer Express*, Future Publishing, 30 Monmouth St, Bath, Avon, BA1 2BW.

The Master Series 5V offers you the following essential keyboarding facilities:

- 61 full sized keys
 - Velocity and Release Velocity Sensing
 - Eight user definable keyboard zones
 - MIDI echo, delay and arpeggio
 - 100 performance memories - 90 programmable
 - Four independant MIDI outputs
 - Three Continuous controller wheels
- And much much more.....

So now for the questions:

1) Who was the keyboard player for '70s super-group Genesis?

- a) Tony Banks
- b) Gordon Banks
- c) Gordon Richards
- d) Joddrill Banks

2) What do the black keys on a piano signify

- a) They forgot to paint them white
- b) For Paul Macartney and Stevie Wonder to sing about

If you want to make music you should be using the correct equipment. The Cheetah Master Series 5V has long been part of the basic computer musicians kit and now one of them could be yours for the price of a stamp - first class that is!

- c) Sharps and flats
- d) Major 7ths

3) What is the only musical key with no sharps or flats?

- a) C major
- b) D minor
- c) E sharp
- d) C flat

4) Who was the famous American keyboard player who specialised in cheesy grins, spangly suits and candlabra?

- a) Bach
- b) Colin Powell
- c) Liberace
- d) Roger Rabbit

5) Which family of musical instruments does the piano belong to

- a) Strings
- b) Percussion
- c) Woodwind
- d) Robinson

6) Which company is known for producing pianoes?



- a) Suzuki
- b) Steinway
- c) Gibson
- d) Fender

7) Where is Cheetah based ?

- a) Cardiff
- b) Paris
- c) Berlin
- d) Ulan Bator

8) What is waltz time in musical notation?

- a) 3/4
- b) 4/4
- c) 65/8
- d) 6/8

9) Who was the famous Spanish classical guitar player?

- a) Jimi Hendrix
- b) Segovia
- c) John Lennon
- d) Rick Wakeman

10 Who was the famous gypsy guitar player who lacked digits?

- a) Django Rheinart
- b) John Williams
- c) Julian Bream
- d) Julian Clarey

Fill in your answers to the questions, write out your name and address and stick this coupon on the back of an postcard. Then send it to: Music Competition, New Computer Express, 30 Monmouth Street, Bath BA1 2BW.

Answers: 1) 2) 3) 4) 5)
 6) 7) 8) 9) 10)

Name:

Address:

IF YOU LIKE MUSIC...

Question: What do the Amiga and the ST have in common?

Answer: Format – *Amiga Format* and *ST Format*.

From the makers of *New Computer Express*, the best weekly source of all that's happening in the world of MIDI, come the biggest and best-selling Amiga and ST magazines in the country.

- Each and every single month the *Formats* bring you full and detailed news, previews, reviews, features, interviews and information - in fact, *everything* you need to know about the ever-growing world of MIDI music. Guaranteed.

Just look at what they've covered in recent months.

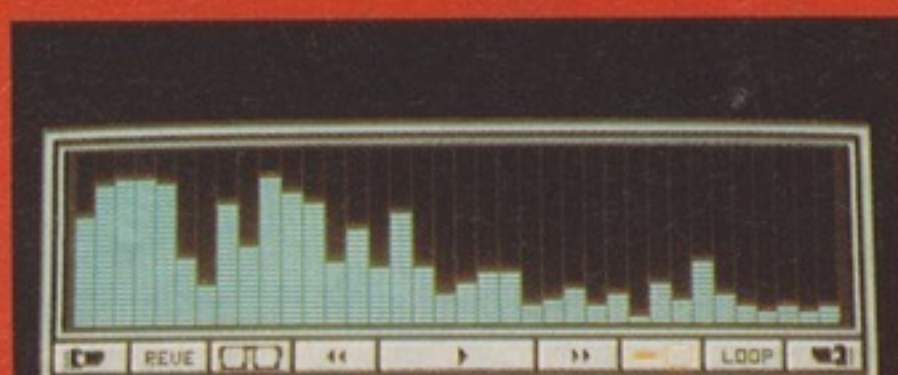
- *Amiga Format* has brought you the authoritative and most informative reviews around on music packages such as an exclusive look at the Funlab bundle for beginners, MIDI sequencer *Harmoni*, sample sequencer *Mugician*, new samplers *Technosound* and *Audio Engineer*, the bizarre experimental programs *Hyperchord* and *Pixound*, the sequencer *Trax*, plus a full round-up of the year's best musical buys – and that's in just five months.
- On the Cover Disk which comes with every issue there's been such musical delights as demos of the sample sequencer *Quartet* and the Mastersound sampler, while complete *Soundtracker*-type programs, sample players, music demos and sample tunes make a frequent appearance.
- During those same few months *ST Format* has been presenting the low-down on C-Lab *Creator*, *Sound Tools*, the *Replay* and *Pro-Series* sampling packages, the EVS-1 synthesizer, *TCB Tracker*, *Chameleon*, *Sequencer One* by Gajits and *Prodigy* by the Digital Muse, plus features on how Queen and Tangerine Dream use the ST and a monthly section called *MIDI Helpfile* that answers all your questions, explains all the jargon and solves your problems.
- And if you'd been buying *ST Format* you'd already have added all these musical goodies to your collection: the complete version of the superb *Henry Cosh Accompanist* sequencer, a MIDI data-sender and MIDI data files and a fully useable demo version of the superb *TCB Tracker* – plus much, much more! They've *all* been on the *ST Format* Cover Disk.
- Besides all this, both magazines cover the full range of Public Domain MIDI software every month, saving you money and expanding your musical horizons.
- No-one knows MIDI better than the *Formats*. It's a fact. So whether you're just starting to discover the musical potential of your Amiga or ST and you want to know what it can really do, or you need an in-depth review of the very latest in professional MIDI software, we've got the monthly magazine for you.
- For just £2.95 you'll be getting the best deal any musician could hope for: a bulging magazine and the biggest and best Cover Disk for your machine in the entire world.
- *Amiga Format* and *ST Format*: March issue on sale at a newsagent near you on **Thursday 14 February**.



...YOU'LL LOVE FORMAT!

MASTER SOUND 2

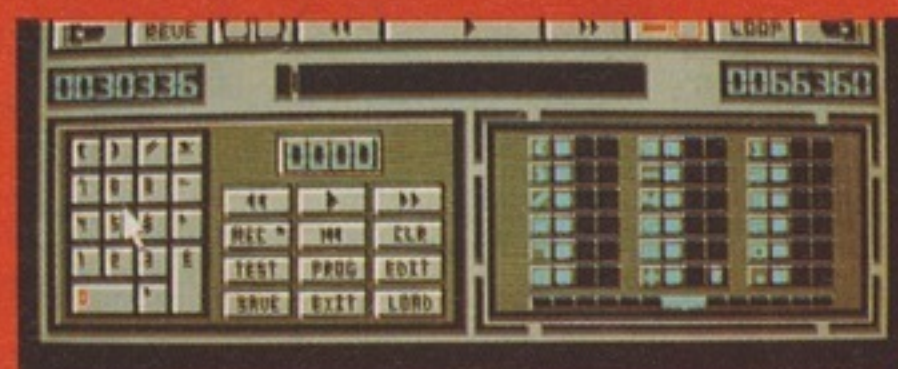
SOUND SAMPLING HARDWARE AND SOFTWARE FOR THE ATARI ST & STE



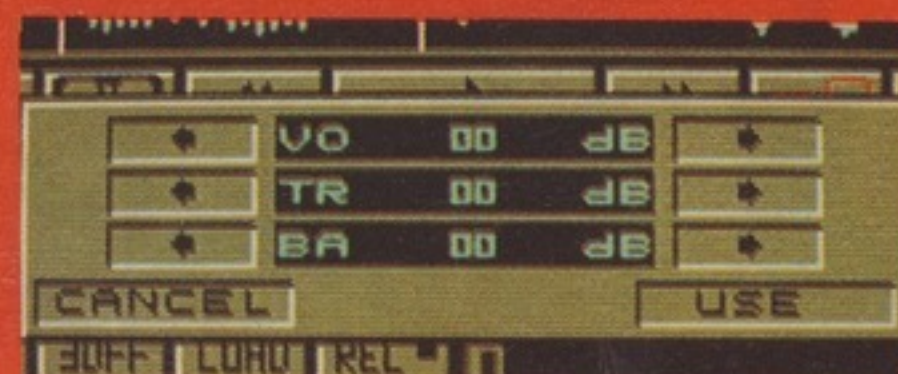
36 BAR GRAPHIC
EQUALISER DISPLAY



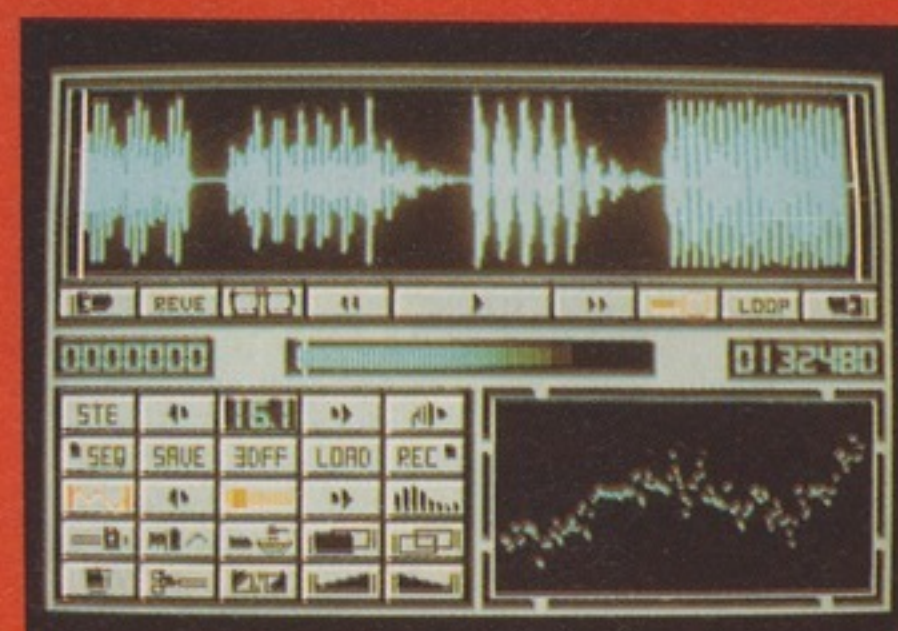
3D FFT DISPLAY SCREEN



SEQUENCER CONTROL PANEL



NEW STE CONTROL PANEL



MAIN EDITOR SCREEN
WITH OSCILLOSCOPE

WHAT IS MASTER SOUND?

Master Sound is a low cost, high quality sound sampler for the Atari ST & STE range of computers. The sampler cartridge enclosed in this package plugs into your ROM port on the side of your computer and allows you to record sounds from devices such as Personal Cassette players, Compact Disc Players etc. Once in the computer MASTER SOUNDS unique editor will enable you to edit the sound in practically any way you can imagine. Once you have the sound sample how you want it, you may incorporate it into your own Demo's or programs or use MASTER SOUNDS own built in sample sequencer to play back the sample in sequence with other samples!

THE MASTER SOUND EDITOR

Incorporates the following facilities:

- | | | | |
|--------------|-------------------------------------|----------------|------------------|
| * SAMPLE | * PLAY | * LISTEN | * LOOP |
| * CUT | * COPY | * OVERLAY | * WIPE |
| * FADE IN | * FADE OUT | * VOLUME | * REVERSE |
| * SHRINK | * FILTER | * MAGNIFY | * TRIGGER |
| * LOAD | * SAVE | * SCOPE | * REAL TIME FFT |
| * VU METER | * SEQUENCER | * MIDI TRIGGER | * 3D FFT DISPLAY |
| * AVR FORMAT | * STE VOLUME, BASS & TREBLE CONTROL | | |

An impressive Spectrum Analyzer, Oscilloscope and 3D FFT display enable the user to monitor frequency content and volume with ease, and help you to ensure that the sample quality is at its best.

THE MASTER SOUND SEQUENCER

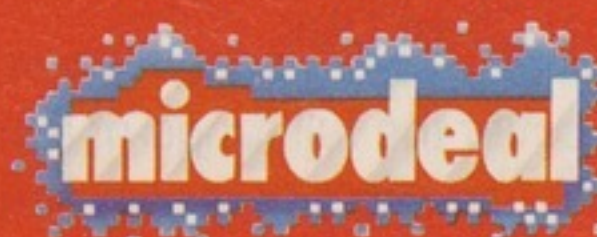
Allows you to play back samples in a sequence. Up to 18 samples can be held in memory at once and sequences are as simple to record as tapping keys on the computers keyboard. Once recorded the sequencer can save the samples and sequence file out onto disc so that the files can be used in the sequence player provided.

THE MASTER SOUND DEMO

Allows you to play back your own sequenced sounds created by the editor while displaying picture files. This is great for creating your own public domain demo discs without having to be a computer programmer.

ADVANTAGES OVER MASTER SOUND 1

- * Midi compatibility allows you to playback samples at different frequencies from an external midi keyboard with a midi-out socket.
- * Additional STE options include Volume, Bass, & treble controls Playback via the STE's built in sound sockets.
- * New 3D Fast Fourier Transform display allows you to see the samples frequency composition in a 3D display.
- * Volume down option
- * Choice of filters
- * Choice of compression ratios
- * Enhanced sample frequencies up to 30 KHZ
- * Sequencer can now handle variable frequencies from 3 to 16KHZ



© Copyright Microdeal 1990
All Rights Reserved

UPGRADE FROM
MASTER SOUND 1
PHONE FOR DETAILS

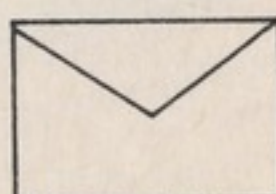
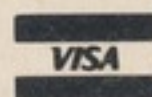
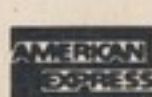
ATARI ST MASTER SOUND ORDER FORM

Master Sound is £39.95 post & packing £1 (all prices inc V.A.T.)



**BY PHONE
WITH
CREDIT CARDS**

(0726) 68020



BY POST: with Cheque · Postal Order · or Credit Card

Name

Address

Post Code

Credit Card Type Expiry Date

Number

Please allow 28 days for delivery

Send to: Microdeal · PO Box 68 · St Austell · Cornwall · England · PL25 4YB



WIN
COMPUSERVE
SUBS
WORTH
OVER
£650

Issue 118 • 9th February 1991 • 70p

COMPUTER **EXPRESS**

FIRST NEWS • FIRST REVIEWS • BEST BUYS • YOUR WEEKLY GUIDE

THIS WEEK

AMIGA

A1500 price cut imminent
PLUS: The amazing A500
trade-in deal

ATARI

An ST compatible Unix
workstation is announced
PLUS: A stereo ST for only
£20 extra?



FAXES:

Why buy a machine
when you can just
slot in a card?

BUDGET IBM

FREE! MUSIC 32-page supplement **GUIDE**

**How to make
music with your
computer**

● Setting up a micro music system -
three options examined ● MIDI made
clear ● All the software you need and
how to use it ● How the stars do it!

**MEGADRIVE
NINTENDO
ATARI LYNX
GX-4000
& 44 PAGES OF**

**SHOPPING
EXPRESS**

BARGAINS !!!



SUPERCOMPUTERS

How you could soon have
mainframe power at home



Stylishly violent

"WE MUST STOP THE SWEATSHOPS"

BRITAIN'S GAMES AUTHORS SPEAK OUT - SEE PAGE 8

